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Domino Server Monitoring

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Agenda

- Server monitoring and analysis
- Domino Domain Monitoring
- Custom Monitoring and Third-Party Products

Server Analysis Overview

- Log.nsf
- Server Console
- Event Generators and Handlers
- Statistics Collection
- Activity Logging
- DCT
- DDM

Server Analysis Overview

- Admin client tab for server analysis shows
 - Log
 - Catalog
 - Administration Requests
 - Activity Trends
 - Domino Domain Monitoring
 - If you are not using it now, turn it on
 - Enable all of the probes
 - Let it run for the weekend
 - Turn them off if you're uncomfortable with letting it run
 - DDM finds problems before they cause crashes
 - Corrupt databases
 - “Bad” agents

Server Monitoring

The screenshot displays the Lotus Symphony Server Monitoring interface. On the left is a tree view of the IRIS Domain structure. The main area shows a table of server monitoring data. The table columns include: Hea (Health), 08:30:13 AM - 08:36:03 (Time), Adm (Admin), Age (Age), Dat (Data), Eve (Event), Ind (Index), Rep (Replication), Rot (Rotation), Users, Dead, Hold, Waiting, Availability, and ElapsedTime. The servers listed are Brooks/Iris, Chicks/Iris, Dixie/Iris, Dolly/Iris, Garth/Iris, Nelson/Iris, Page/Iris, parton/Iris, and Willie/Iris. A legend at the bottom indicates task status (Not running, Not responding, Running) and task errors (Fatal, Failure, Warning).

Hea	08:30:13 AM - 08:36:03	Adm	Age	Dat	Eve	Ind	Rep	Rot	Users	Dead	Hold	Waiting	Availability	ElapsedTime
!	- Brooks/Iris	🌟	🌟	🌟	🌟	🌟	🌟	🌟	104	0	0	0	55	17 days 13:21
!	- Chicks/Iris	🌟	🌟	🌟	🌟	🌟	🌟	!	125	0	0	0	100	9 days 14:04
?	- Dixie/Iris	-	-	-	-	-	-	-	-	-	-	-	-	-
	- Dolly/Iris	🌟	🌟	🌟	🌟	🌟	🌟	🌟	127	0	0	1	100	5 days 18:05
!	- Garth/Iris	🌟	🌟	🌟	🌟	🌟	🌟	🌟	80	0	0	0	93	17 days 13:20
	- Nelson/Iris	🌟	🌟	🌟	🌟	🌟	🌟	🌟	65	0	0	0	93	14 days 21:20
	- Page/Iris	🌟	🌟	🌟	🌟	🌟	🌟	🌟	119	0	0	0	0	3 days 16:08
!	- parton/Iris	🌟	🌟	🌟	🌟	🌟	🌟	🌟	104	0	0	1	49	5 days 18:05
	- Willie/Iris	🌟	🌟	🌟	🌟	🌟	🌟	🌟	65	0	0	0	28	6 days 20:57

Task Status: Not running Not responding Running






Task Errors: Fatal Failure Warning

Domino Configuration Tuner(DCT)

- Easy to acquire, Easy to update, Easy to use
- Runs from your admin client
- Assess existing Domino deployments
- Requires no change to existing Server/Domain configuration
- Runs under/against Notes/Domino 7 and beyond
- Scans/evaluation can be initiated manually or scheduled
- Easy to expand rule catalog, frequently updated
- Rules are updated by IBM
 - New rules are pulled by you upon request
- Checks for low-hanging fruit in configurations
- Run it to help clean up an existing environment

Domino Configuration Tuner(DCT)

Lotus Domino Configuration Tuner

 Run New Scan
  View Results
  Check for Updates
  Preferences
  Help

dct.nsf is on Local (Rule Definitions: 11/19/2009)

Current Report Change | Delete | Run again

Music






12/02/2008 02:08:37 PM EST

Filtered by Server Change

Show reports for all servers Change

- ⊕ ACDC/Iris
- ⊖ Aerosmith/Iris
 - ⊖ Critical
 - notes.ini DEBUG_PD_NAGLE_OFF=1 will disable the TCP Nagle algorithm. When enabled the algorithm has undesired interaction with NRPC on some platforms (pre 8.5 exclusive)
 - notes.ini LOG_MAILROUTING specifies how much logging detail the mail router sends to the server console and log file
 - ⊖ Warning (High)
 - database ODS version should be as high as possible
 - notes.ini DONT_CACHE_MONITOR_FORMULAS=1 will prevent caching of mail rule formulas to reduce memory consumption.
 - notes.ini FTG_USE_SYS_MEMORY reduces memory fragmentation related to full text index searching (post 6.5.4 inclusive)
 - notes.ini FT_FLY_INDEX_OFF=1 will prevent on-the-fly full text index creation thereby reducing disk I/O and CPU consumption
 - notes.ini SERVER_NAME_LOOKUP_NO_UPDATE can prevent unnecessary Domino Directory views updates (post 8.0.1 inclusive)
 - notes.ini UPDATE_FULLTEXT_THREAD enables using a separate thread to do full text indexing which can improve server performance.
 - ⊕ Warning (Low)
- ⊖ Garfunkle/Iris

All Servers

Severity	Count	Percent
 Critical	6	2.33%
 Warning (High)	25	9.69%
 Warning (Low)	56	21.71%
 Normal	171	66.28%
 Exception	0	0%

Servers Scanned:

- ACDC/Iris
- Aerosmith/Iris
- Garfunkle/Iris

Servers Not Scanned:

- Blood/Iris (Unable to find path to server)
- Sweat/Iris (Unable to find path to server)
- Tears/Iris (Unable to find path to server)

DCT vs. DDM

- Domino Configuration Tuner (DCT) is a client based static analysis tool. DCT is great for detecting a wide variety of server configuration issues. It evaluates server settings according to a growing catalog of best practices.
- Domino Domain Monitoring (DDM) is a run-time server feature, DDM is great for detecting, understanding and acting on run time issues.

Agenda

- Server monitoring and analysis
- Domino Domain Monitoring (DDM)
- Custom Monitoring and Third-Party Products

Why Domino Domain Monitoring(DDM)

- *PainPoint 1*
- There is no tool can provide single view of the overall status of multiple servers across one or more Domains.
- *PainPoint 2*
- Administrators always spend much time to find out the cause when a server problem occur .
- *PainPoint 3*
- The analysis and fix of problem strongly depends on the experience and skill of Administrators.

What is Domino Domain Monitoring(DDM)

- First introduced in Domino 7.0
- A server based monitoring solution that provides to Administrators a **single** view of the overall status of multiple servers across domain
- Highly-**configurable** probes categorized by feature areas
- Default settings for easy **out-of-the-box** setup
- DDM automates problem determination and analysis in order **to reduce costs and time** associated with monitoring and troubleshooting your Domino environment
- Domino Administrators use the information provided by DDM to quickly **resolve issues before they cause more serious problems**

DDM Key Features

- **Active monitoring** capability: 58 new probes with highly-configurable schedules, content and targets.
- Domino domain monitoring data aggregation with **collection hierarchies**
- **Automatic problem determination** and determination of probable cause in multiple feature areas, and provide possible solution.
- **Delegation** of problems
- Automation of **corrective actions**
- **Auto-closing** for the resolved problem.

Benefit from Domino Domain Monitoring

- Reduction in the Total Cost of Ownership by monitoring and troubleshooting servers and gathering the health of entire domain in a single UI/location
- Easy access to assessment and error reports
- Correlation capability for related problems
- Cross-server notification and reporting mechanism
- Corrective action context in many cases.
- Because efficient monitoring and problem resolution leads to
 - Server stability
 - Server uptime
 - Focus on business needs instead of the mechanics of administration

log.nsf vs ddm.nsf

- **Domino generates errors and messages**
 - Error ... “Object Store Manager: File does not exist”
 - Message ... “Index update process started”
- **All logged errors and messages are raised as events**
- **Log.nsf records errors and messages sequentially**
 - Some messages are deliberately excluded because ...
 - they are generated by printf debug spewage
 - an events4.nsf log filter configuration doc is defined
- **Log.nsf**
 - Pro: Great for maintaining a record of all errors and messages
 - Pro: Great for debugging, if you know what you are looking for
 - Con: Dumping ground for lost information

log.nsf vs ddm.nsf (Cont.)

- As of Domino 7, all events are cached and tracked by DDM
- DDM.NSF is the on-disk version and superset of the event cache
- DDM.NSF records a set of associated events into a single report document (not just a single event)
 - Pro: great for recording problem context
 - Pro: great for tracking and organizing problems
 - Pro: great for exposing knowledge about problems
 - Pro: great for resolving problems
 - Con: lousy for tracking sequential order of problems
 - Con: lousy for extracting ad hoc data from reports

The Components of DDM

Events	Events are generated by enabled probes, enabled Event generators and non-configurable embedded probes.
Probes	Probes do the majority of the work and can be configured to monitor Events in multiple feature areas (Replication, Security, and soon).
Filter	Filters control the volume of Events that appear in ddm.nsf. Filters are used to specify what type of Events should be included in the Domino domain monitor database.
Collection Hierarchy	One or more collection hierarchies can be created to roll up the Domino domain monitoring results (Event) information into one or more collection servers.
User Interfaces	Monitoring Configuration (Events4.nsf) -- used to configure DDM probes, collection hierarchies and filters Domino Domain Monitor (ddm.nsf) -- stores probe results (Events) by severity, date, and type.

The Five C's of DDM

- Consolidate
 - Track multiple, related errors in a single event report
- Check
 - Assess health of functional areas
- Collect
 - Access all domain wide reports from a single database
- Correlate
 - Locate related reports from other servers
- Correct
 - Assess knowledge base of explanations and recommendations.
 - Click to resolve issues

The Five C's of DDM

- Consolidate
 - Track multiple, related errors in a single event report
- Check
- Collect
- Correlate
- Correct

Simple and Enhanced Events

- **Events can have one or two associated errors.**
- **When there are two errors, the “root cause” is the second error.**
 - 1 error: “Event: Could not locate view 'svrcollhier”
 - 2 errors: “Object Store Manager: File does not exist”
- **Simple events are legacy events which include these attributes ...**
 - Time stamp, originating server, resource strings and IDs, severities, types
- **Enhanced events also include the following attributes ...**
 - New types, subtypes, target server
- **Enhanced events include one or more of these attributes ...**
 - Target database, target user, target UNID, extra target data (i.e. string blobs), rich text, call stacks, correlation codes, and the NOTEID of a config doc responsible for firing the event.
 - This “target” data is some of the new event “context”



Event Reports

- Like log.nsf, all events are recorded into ddm.nsf
- Unlike log.nsf, each set of events has it's own report document
- Each set of events has an associated unique ID (a PUID)
- Every event with the same PUID is mapped into the same ddm.nsf report document
- A PUID is built using the enhanced event context data
 - Target database, target user, target agent, etc.
- DDM.nsf Reports are presented in a variety of views, as follows ...

Event Report Views – Categorized

- By Severity, By Date, By Type, By Server, By Assignment

The screenshot displays the IBM DDM (Data Domain Monitoring) interface. It features a sidebar on the left with navigation options: My Events, By Severity, By Date, By Type, By Server, By Assignment, and Open Configuration. The main area shows five overlapping panels, each representing a different view: 'All open events, sorted by severity', 'All open events, sorted by date', 'All open events, sorted by type', 'All open events, sorted by server', and 'All open events, sorted by assignment'. The 'sorted by assignment' view is the most prominent, showing a table with columns for '#', 'Date', 'Server', and 'Open Events By Assignment'. The table content is as follows:

#	Date	Server	Open Events By Assignment
2			0 Demo Occurrences
1			2 Demo Audit
1			3 Demo CA Config
34			Art Thomas/Westford/IBM
17			Failure
13			Warning (High)
1			Database
1			Database: Monitoring
	Thu 02/09	Jethro/Iris	Database open error: mail/sbussell.nsf: T

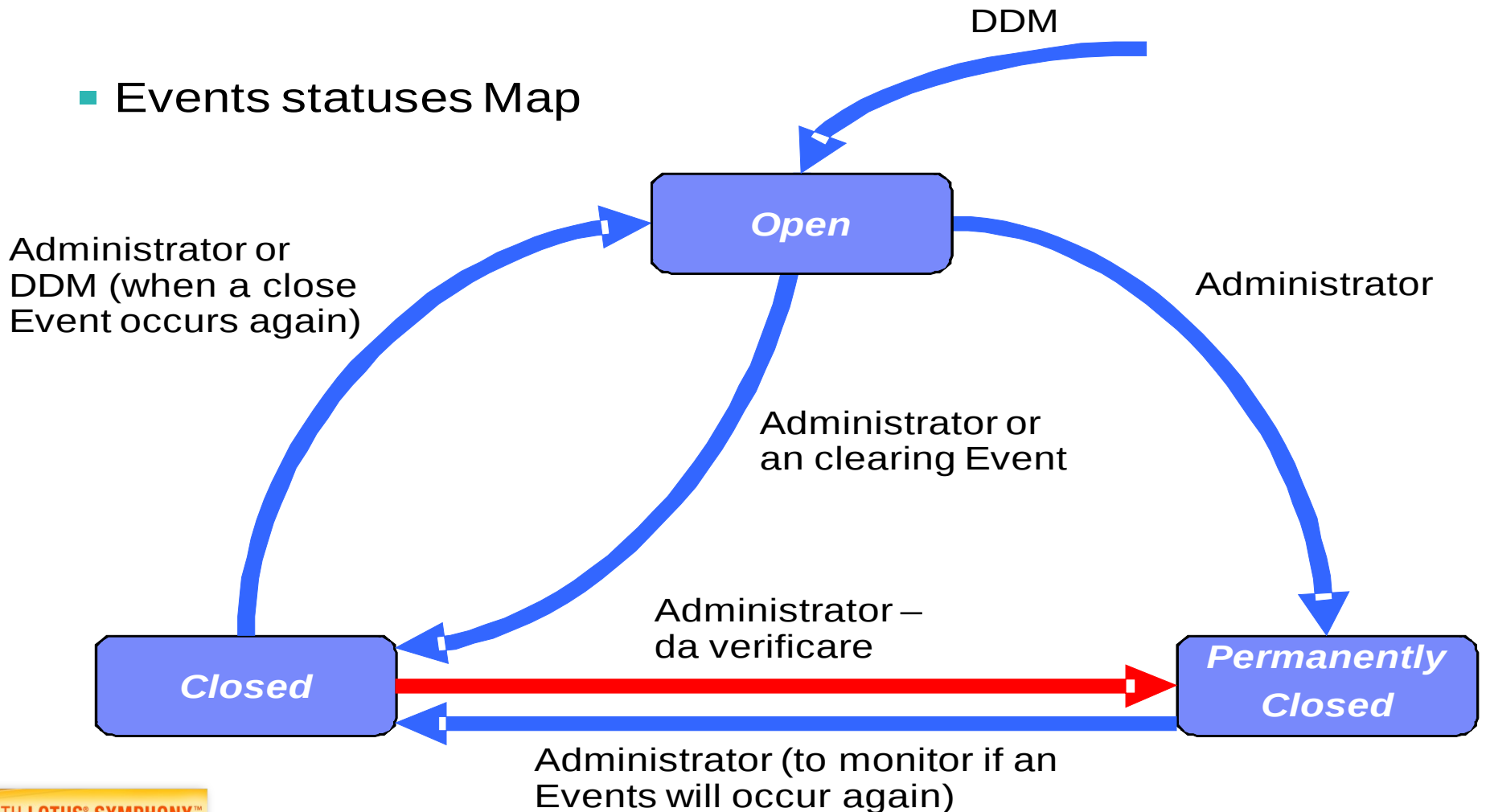
Below the table, there are action buttons: Refresh, Assign..., Change State, and Add Comments... The 'By Assignment' option in the sidebar is highlighted.

Event Report State

- **Open** = The event has a non-Normal severity and has not been manually closed
 - Auto Clearing Events = Some events can be automatically closed by DDM if the problem is reported as resolved with a Normal severity event
 - Many events must be closed manually
 - Simple events never auto close (only enhanced events)
- **Closed** = The event has a Normal severity or has been manually closed
 - Automatically reopened if a severity change is detected
- **Permanently Closed** = Used by Admins to say “I don’t care about this problem, keep it out of my sight.”
 - Not automatically reopened, on a Normal severity, but continue to be tracked and recorded in its reports

Events Status Map

- Events statuses Map



Event Report Views – Open, Recent, All

- Open Events = All reports with a severity of non-Normal
- Recent Events = Actively Open or Closed in the past week
- All Events = Every Open, Closed or Permanently Closed report

The screenshot illustrates the DDM Event Report interface with three overlapping panels, each showing a different view of events. The top panel is titled 'Open Events', the middle panel is 'Recent Events', and the bottom panel is 'All Events'. Each panel has a red box around its respective view button. The bottom panel displays a table of events with columns for #, Date, Server, and All Events By Severity.

#	Date	Server	All Events By Severity
★ 18500			Open
★ 7078			Closed
15			Permanently Closed
★ 3			Failure
12			Warning (High)
12			Web: Configuration
★	Thu 02/16	zzz deleted KDS3/Iris	Web Best Practices Probe: analyzed, and 76 percent of recommended best practice

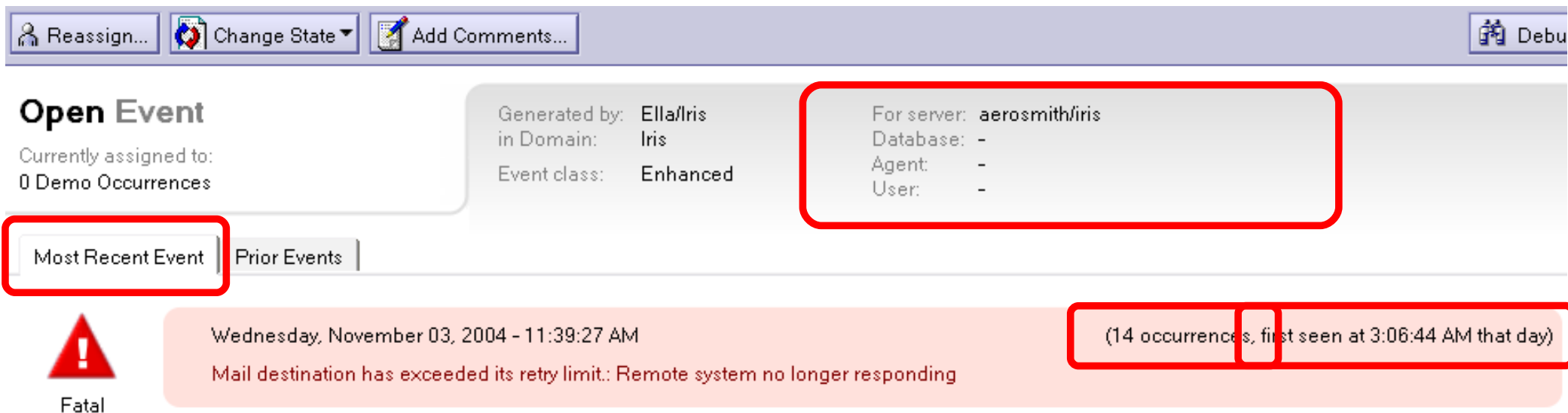
Event Report Basics

- Comments, State & Assignment actions available in views and documents
- Originating server, Simple/Enhanced designation
- Available context data of enhanced events is highlighted
- The same error as that recorded in log.nsf
- With the same time stamp

The screenshot shows the Lotus Notes Event Report interface. At the top, a toolbar contains three buttons: 'Reassign...', 'Change State', and 'Add Comments...', all highlighted with red boxes. To the right of these buttons is a 'Debug' button. Below the toolbar, the 'Open Event' section is highlighted with a red box. It contains three sub-sections: 'Currently assigned to: Harry Peebles/Westford/IBM', 'Generated by: support/iris in Domain: iris Event class: Enhanced', and 'For server: Support/Iris Database: Supportrepository1.nsf Agent: Update SPR with Hotfix details (Schedule) User: Steve Mullen/Westford/IBM'. Below this, there are two tabs: 'Most Recent Event' and 'Prior Events'. A red box highlights the event details: 'Friday, February 17, 2006 - 4:35:13 AM' and 'Agent Manager: 1340 seconds CPU usage by agent 'Update SPR with Hotfix details (Schedule)' in database 'Supportrepository1.nsf'. Threshold level 600 seconds. Agent Owner: 'Steve Mullen/Westford/IBM'.

Event Report Occurrence Count

- Additional occurrences of the same event are noted in the report
- The time of the first occurrence is recorded
- If you want the time of the in between occurrences ... search log.nsf
- Some enhanced events have less target information than others
- The current disposition for this error is the “Most Recent Event”



The screenshot shows the Lotus Notes interface for an event report. At the top, there is a toolbar with buttons for 'Reassign...', 'Change State', 'Add Comments...', and 'Debug'. Below the toolbar, the event details are displayed. The 'Open Event' section shows 'Currently assigned to: 0 Demo Occurrences'. The event metadata includes: 'Generated by: Ella/Iris', 'in Domain: Iris', 'Event class: Enhanced', 'For server: aerosmith/iris', 'Database: -', 'Agent: -', and 'User: -'. The event is categorized as 'Most Recent Event' (highlighted with a red box) and 'Prior Events'. A red warning triangle icon is shown next to the event description: 'Fatal'. The event occurred on 'Wednesday, November 03, 2004 - 11:39:27 AM' with the message: 'Mail destination has exceeded its retry limit.: Remote system no longer responding'. The occurrence count is '(14 occurrences, first seen at 3:06:44 AM that day)', which is also highlighted with a red box.

Event Report Prior Events

- When a new error maps into this report, but is not an exact match of the “Most Recent Event”, instead of bumping the occurrence count ...
 - The new error becomes the “Most Recent Event”
 - What had been the “Most Recent Event” gets pushed into the “Prior Event” list

Most Recent Events | **Prior Events**

Fatal

Tuesday, February 07, 2006 - 10:56:08 AM
Mail from bhsurfers.iris.com/iris to destination ace/iris has exceeded its retry limit.: Rerr
More...

Failure

Tuesday, February 07, 2006 - 10:07:05 AM
Mail from bhsurfers.iris.com/iris to destination ace/iris has exceeded its retry limit.: Rerr
More...

Normal

Wednesday, January 25, 2006 - 8:29:45 AM (3 occur)
Mail from bhsurfers.iris.com/iris to destination ace/iris is under its message limit.
More...

This will happen because of a change of ...

- Severity
- Error text (new error)
- Error text (change to substituted parameter)
- ... and some others.

Event Report Prior Events

- At the bottom of the report is the Event change History.
- DEBUG_DDM=1 in the Notes client notes.ini will reveal some useful information about the report, like the PUID

Event Change History:

04/19/2005 11:21 AM : John Paganetti/Westford/IBM - changed state to Permanently Closed
 04/19/2005 11:21 AM : John Paganetti/Westford/IBM - added comments: Servers are out of Service
 03/04/2005 11:50 AM : Chicks/Iris - changed state to Open

Developer debug information:

CPU utilization no longer exceeds configured thresholds.

Template Version:	7.02	ACL level:	Manager (6)
Data Version:	3	ACL roles:	[Assign Events]; [Change State]
ConfigNoteID:	43BDA	Owner:	Yes
GeneratedNoteID:	0		
PUID:	Operating System/CPU C:\Program Files\Lotus\Notes\...		

	Reason for change:	First occurrence in:	Latest occurrence in:	# Occ:	First occurrence:	Latest occurrence:	Latest Server.Time.Start:
1	Main Error	Release 7.0.1	Release 7.0.1	1	02/13/2006 04:47:01 AM	02/13/2006 04:47:01 AM	02/03/2006 13:36:46 EST
2	Main Severity	Release 7.0.1	Release 7.0.1	2	02/13/2006 04:34:01 AM	02/13/2006 04:44:01 AM	02/03/2006 13:36:46 EST
3	Main Error	Release 7.0.1	Release 7.0.1	1	02/13/2006 04:24:02 AM	02/13/2006 04:24:02 AM	02/03/2006 13:36:46 EST
4	Main Error	Release 7.0.1	Release 7.0.1	1	02/13/2006 03:36:02 AM	02/13/2006 03:36:02 AM	02/03/2006 13:36:46 EST
5	Main Error	Release 7.0.1	Release 7.0.1	2	02/13/2006 03:17:01 AM	02/13/2006 03:27:01 AM	02/03/2006 13:36:46 EST
6	Main Error	Release 7.0.1	Release 7.0.1	1	02/13/2006 03:07:02 AM	02/13/2006 03:07:02 AM	02/03/2006 13:36:46 EST
7	Main Severity	Release 7.0.1	Release 7.0.1	3	02/13/2006 02:39:01 AM	02/13/2006 02:59:01 AM	02/03/2006 13:36:46 EST
8	Main Severity	Release 7.0.1	Release 7.0.1	9	02/13/2006 01:09:02 AM	02/13/2006 02:29:02 AM	02/03/2006 13:36:46 EST
9	Main Severity	Release 7.0.1	Release 7.0.1	1	02/13/2006 12:59:01 AM	02/13/2006 12:59:01 AM	02/03/2006 13:36:46 EST
10	Main Severity	Release 7.0.1	Release 7.0.1	5	02/13/2006 12:09:02 AM	02/13/2006 12:49:02 AM	02/03/2006 13:36:46 EST



Consolidation into Event Reports, the bottom line ...

- **Error states and the history of those states are organized into report documents**
- **Reports can be used as trouble tickets**
- **Reports include the contextual details about all the errors tracked by that document**

The Five C's of DDM

- Consolidate
 - Track multiple, related errors in a single event report
- Check
 - Assess health of functional areas
- Collect
- Correlate
- Correct

DDM Probe Configuration

- Events4.nsf – New DDM section
- DDM Probes / By Type
- Types are the major functional areas

The screenshot shows the 'Monitoring Configuration' window. On the left is a tree view under 'DDM Configuration'. The 'By Type' folder is selected and highlighted with a red box. On the right is a table with columns 'Total', 'Enabled', and 'Type'. The 'Type' column lists various functional areas, each with a plus sign icon, and is also highlighted with a red box.

Total	Enabled	Type
14	7	Application Code
8	4	Database
20	10	Directory
24	11	Messaging
8	4	Operating System
4	2	Replication
10	5	Security
2	1	Server
4	2	Web

DDM Probe Configuration

■ Types expand into subtypes ...

[-] Application Code

- ⊕ Agents Behind Schedule
- ⊕ Agents Evaluated by CPU Usage
- ⊕ Agents Evaluated by Memory Usage
- ⊕ Long Running Agents

[-] Database

- ⊕ Database Compact
- ⊕ Database Design
- ⊕ Database Error Monitoring
- ⊕ Scheduled Database Checks

[-] Directory

- ⊕ Directory Availability
- ⊕ Directory Catalog Aggregation Schedule
- ⊕ Directory Catalog Creation
- ⊕ Directory Indexer Process State
- ⊕ LDAP Process State
- ⊕ LDAP Search Response
- ⊕ LDAP TCP Port Health
- ⊕ LDAP View Update Algorithm
- ⊕ Name Lookup Search Response
- ⊕ Secondary LDAP Search Response

[-] Messaging

- ⊕ Mail DSN
- ⊕ Mail Flow Statistic Check
- ⊕ Mail Reflector
- ⊕ Message Retrieval Process State
- ⊕ Message Retrieval TCP Port Health
- ⊕ NRPC Routing Status
- ⊕ Router Process State
- ⊕ SMTP Process State
- ⊕ SMTP TCP Port Health
- ⊕ Transfer Queue Check

[-] Operating System

- ⊕ CPU
- ⊕ Disk
- ⊕ Memory
- ⊕ Network

[-] Replication

- ⊕ Replication Errors
- ⊕ Scheduled Replication Checks

[-] Security

- ⊕ Security Best Practices
- ⊕ Security Configuration
- ⊕ Security Database ACL
- ⊕ Security Database Review
- ⊕ Security Review

[-] Server

- ⊕ Administration

[-] Web

- ⊕ Web Best Practices
- ⊕ Web Configuration






DDM Probe Configuration

- **Three flavors of probes (some probes have more than one):**
 - Scheduled probes run according to a configurable schedule and defaults are supplied
 - Embedded probes "instrument" the feature area and catch problems/issues as they occur
 - Listening probes run when particular error codes are logged

- **Probe configuration is quick and flexible:**
 - Defaults probe configuration documents supplied for "out-of-box" values
 - "Special target servers" concept allows out-of-the-box probing without having to specify named servers
 - Thresholds and result content are highly customizable
 - what the probe will actually check
 - probe sensitivity (when will they generate an event)
 - what severity event the probe will generate
 - Schedule is highly customizable for schedulable probes
 - Probes can be enabled/disabled per server/server group

DDM Probe Configuration

- Default probe configuration documents ship with Domino 7
- These documents are initially disabled

New DDM Probe Edit Document Delete Document Enable Probes Disable Probes					
Total	Enabled	Type	^	Probe Description	Last Modified By
7	0	Application Code			
1	0	Agents Behind Schedule			
				 Default Application Code/Agents Behind Schedule Probe	Lotus Notes Ter
2	0	Agents Evaluated by CPU Usage			
				 Default Application Code/Agents Evaluated By CPU Usage (Agent Manager)	Lotus Notes Ter
				 Default Application Code/Agents Evaluated By CPU Usage (HTTP)	Lotus Notes Ter

DDM Probe Configuration

- Default probe configuration documents ship with Domino 7
- These documents are initially disabled
- Probes can be enabled/disabled from the view ...

Total	Enabled	Type	Probe Description	Last Modified By
7	0	Application Code		
1	0	Agents Behind Schedule		
			Default Application Code/Agents Behind Schedule Probe	Lotus Notes Ter
2	0	Agents Evaluated by CPU Usage		
			Default Application Code/Agents Evaluated By CPU Usage (Agent Manager)	Lotus Notes Ter
			Default Application Code/Agents Evaluated By CPU Usage (HTTP)	Lotus Notes Ter

DDM Probe Configuration

- Probes can be enabled/disabled from the documents, as well
- The Basics tab always includes type, subtype & Description
- This Mail Reflector probe tracks mail sent to a particular address

Save & Close | **Disable Probe** | Cancel

Messaging Probe: HPES-6FTQ5H

Basics | Schedule

Probe Type:	Messaging
Probe Subtype:	Mail Reflector
Probe Description:	「Demo Mail Reflector Probe」

This probe will test the mail flow to any mail system. To test mail flow to the destination mail domain, you will need to specify a mail recipient. The mail recipient must be configured such that messages received from this probe are sent back to the originator. The subject of the original message must be contained in the subject of the returned message. One way to configure this is to auto-forward messages from the mail recipient to the ISpy mail-in database on the server from which you are probing. *Note:* messages delivered by this probe to the mail recipient will not be automatically deleted from the mail file. You may want to specify a test user.

Which servers should run this probe?

- All Servers in the domain
- Special Target Servers
- Only the following servers:

- All probe config docs include an explanation
- Specify the Target servers for any probe
- This probe will target (run on) all servers in the domain

DDM Probe Configuration

- Select a Special Target Servers type so that you don't have to specifically name servers.
 - DDM automatically figures out which servers are the Mail Servers

Target

Which servers should run this probe?

All Servers in the domain

Special Target Servers

Only the following servers:

Mail Servers

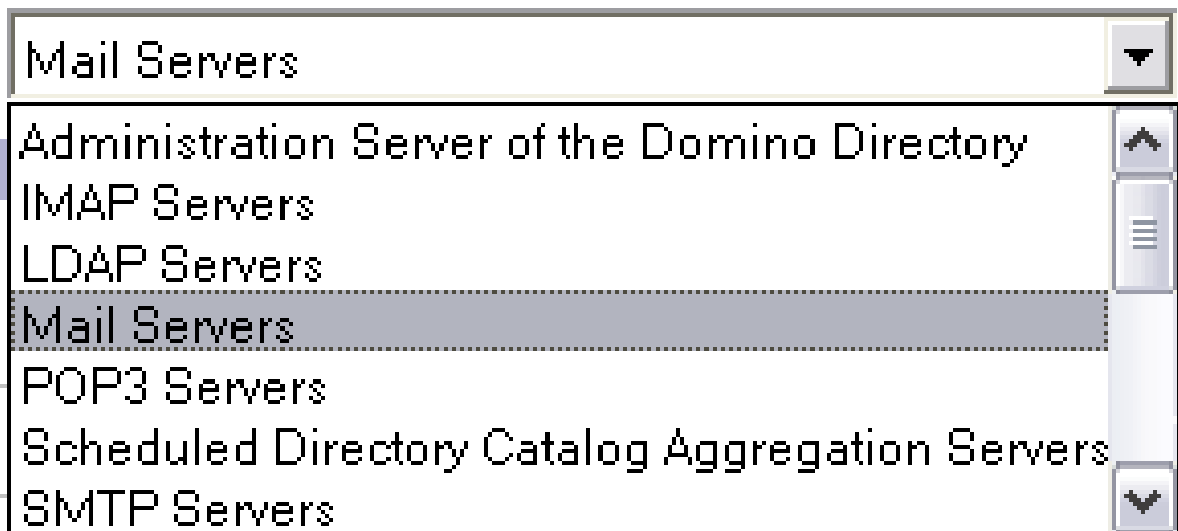
DDM Probe Configuration

- **Select a Special Target Server type so that you don't have to specifically name servers.**
 - DDM automatically figures out which servers are the Mail Servers
 - DDM automatically figures out other server types, depending on server tasks running and other configuration settings

Target

Special Target Server types allow you to configure probes without knowing which specific server names ahead of time in the domain this probe?

- Special Target Servers
- Only the following servers:



A screenshot of a dropdown menu with the following items: Mail Servers, Administration Server of the Domino Directory, IMAP Servers, LDAP Servers, Mail Servers (highlighted), POP3 Servers, Scheduled Directory Catalog Aggregation Servers, and SMTP Servers. The menu has a scroll bar on the right and a dropdown arrow on the left.

Specifics

Mail Recipient:

Enable

5000 seconds

Failure



DDM Probe Configuration

- Depending on the probe, there are a variety of “specifics”

Specifics

Mail Recipient:

Specifics

Severity: Severity:

Enable

Enable

Enable

Errors to ignore: **Basics** | Specifics | Schedule

Specifics

Which server settings should be validated?

<input checked="" type="checkbox"/> Compare Notes Public Key against those stored in directory	<input checked="" type="checkbox"/> Check password
<input checked="" type="checkbox"/> Allow Anonymous Notes Connections	<input checked="" type="checkbox"/> Required Change Interval
<input checked="" type="checkbox"/> Check passwords on Notes IDs	<input checked="" type="checkbox"/> Check for existence of ID file in the person document
<input checked="" type="checkbox"/> Internet Authentication	<input checked="" type="checkbox"/> Check the security of SSL Settings
<input checked="" type="checkbox"/> Check the security of Web Settings	<input checked="" type="checkbox"/> Check the security of Domino Directory Settings
<input checked="" type="checkbox"/> Check the security of Mail Settings	<input checked="" type="checkbox"/> Check the security of DIIOP settings
<input checked="" type="checkbox"/> Check the security of the Remote Debug Manager	<input checked="" type="checkbox"/> Use more secure internet passwords

DDM Probe Configuration

- Scheduled probe configuration documents have a schedule tab
- This Messaging / Mail Reflector probe can run every few minutes, 24/7
- Or, every few minutes, on specific days, in specific time windows

Basics | **Schedule**

Schedule

How often should this probe run?

Run multiple times per day
 Daily
 Weekly
 Monthly

Defined schedule: Every minutes

Should this probe run twenty four hours per day, seven days per week?

Yes No

On which days should this probe run?

Sunday
 Monday
 Tuesday
 Wednesday
 Thursday
 Friday
 Saturday

During which hours of the day should this probe run?

From to

- Select which days the probe will run
- Select the time range when the probe will run

DDM Probe Configuration

- Some probes have the option to run as scheduled or in pseudo real time, like the Security / Best Practice probe
- Disable the “real time” mode to show scheduling options

Basics | Specifics | Schedule

Real Time

The Best Practices probe has the ability to run "real time" rather than on a schedule. Should this probe run "real time"?

Yes
 No

Schedule

How often should this probe run?

Run multiple times per day
 Daily
 Weekly
 Monthly

On which days should this probe run?

Sunday
 Monday
 Tuesday
 Wednesday
 Thursday
 Friday
 Saturday

At what time should this probe run?


04:00 AM

- The schedule controls change to match Multiple, Daily, Weekly, Monthly selections
- For “Daily”, select which days and at what time

DDM Probe Configuration

- Event Reports are generated because an error was logged
- Some of the logged errors are raised by enabled probes. The associated reports include a link back to the enabled probe.
- Event Generators (defined in events4.nsf) can also raise events. Reports created by an Event Generator will include a link back to that configuration document as well.


Most Recent Event | Prior Events



Warning High

Thursday, March 09, 2006 - 2:04:43 AM
Web Best Practices Probe: Server Documents have been analyzed.

Explanation | Details

• Triggered by: 

• Reported by: Event Monitor

Check health of functional areas, the bottom line ...

- **Actively look for problems**
- **Highly configurable and customizable**
- **Default configuration supplied out-of-the-box**

The Five C's of DDM

- Consolidate
 - Track multiple, related errors in a single event report
- Check
 - Assess health of functional areas
- Collect
 - Access all domain wide reports from a single database
- Correlate
- Correct

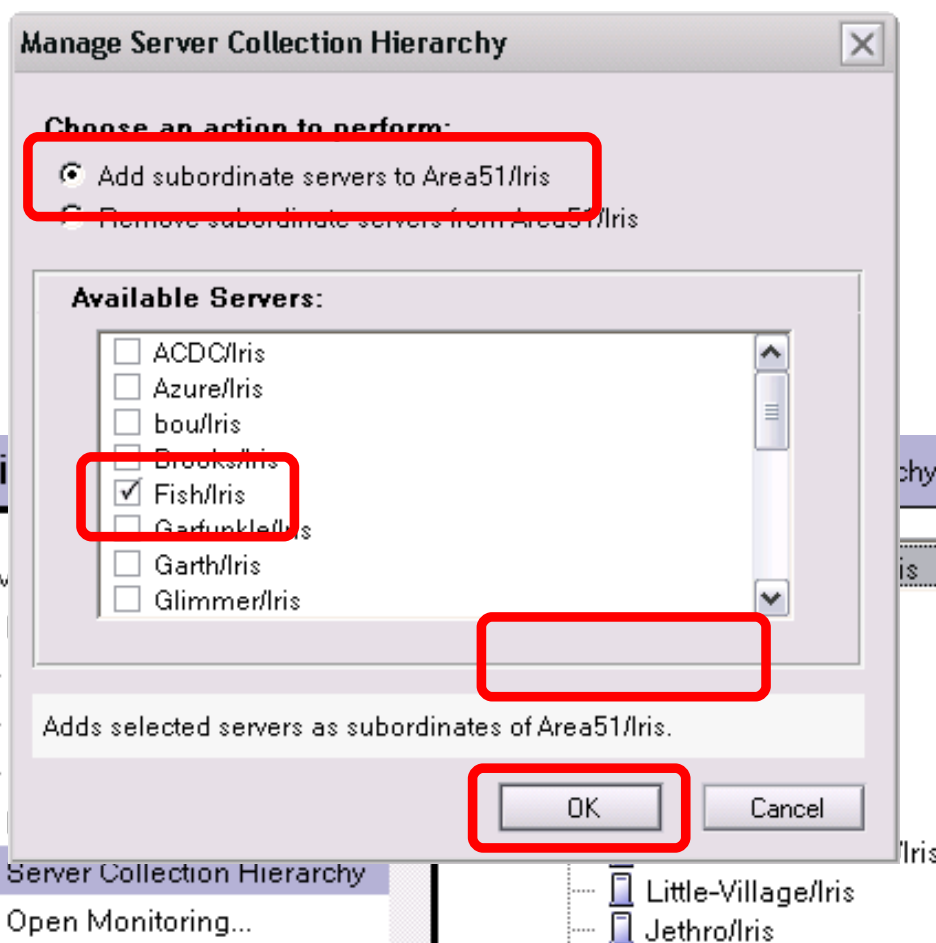
Server Collection Hierarchy

- Available from the DDM section in events4.nsf
- Create, delete or modify a hierarchy
- Select a hierarchy from the dropdown box
- Area51, the collecting server, includes reports from all of it's children servers
- Children servers include only their own reports

The screenshot displays the 'Monitoring Configuration' interface. On the left, a tree view shows 'DDM Configuration' expanded to 'Server Collection Hierarchy'. The main area features a toolbar with three actions: 'New Server Collection Hierarchy', 'Delete Server Collection Hierarchy', and 'Change Collecting Server'. Below the toolbar, a 'Select Hierarchy' dropdown menu is set to 'Area51/Iris'. A list of child servers is shown below the dropdown, including 'Area51/Iris', 'Covey/Iris', 'U2/Iris', 'Support/Iris', 'Rush/Iris', 'radiohead.iris.com/Iris', 'Little-Village/Iris', and 'Jethro/Iris'. Red boxes highlight the toolbar, the dropdown menu, and the list of child servers.

Server Collection Hierarchy

- Or click on an individual server to modify the hierarchy



- Pick the action
- Select the servers
- OK

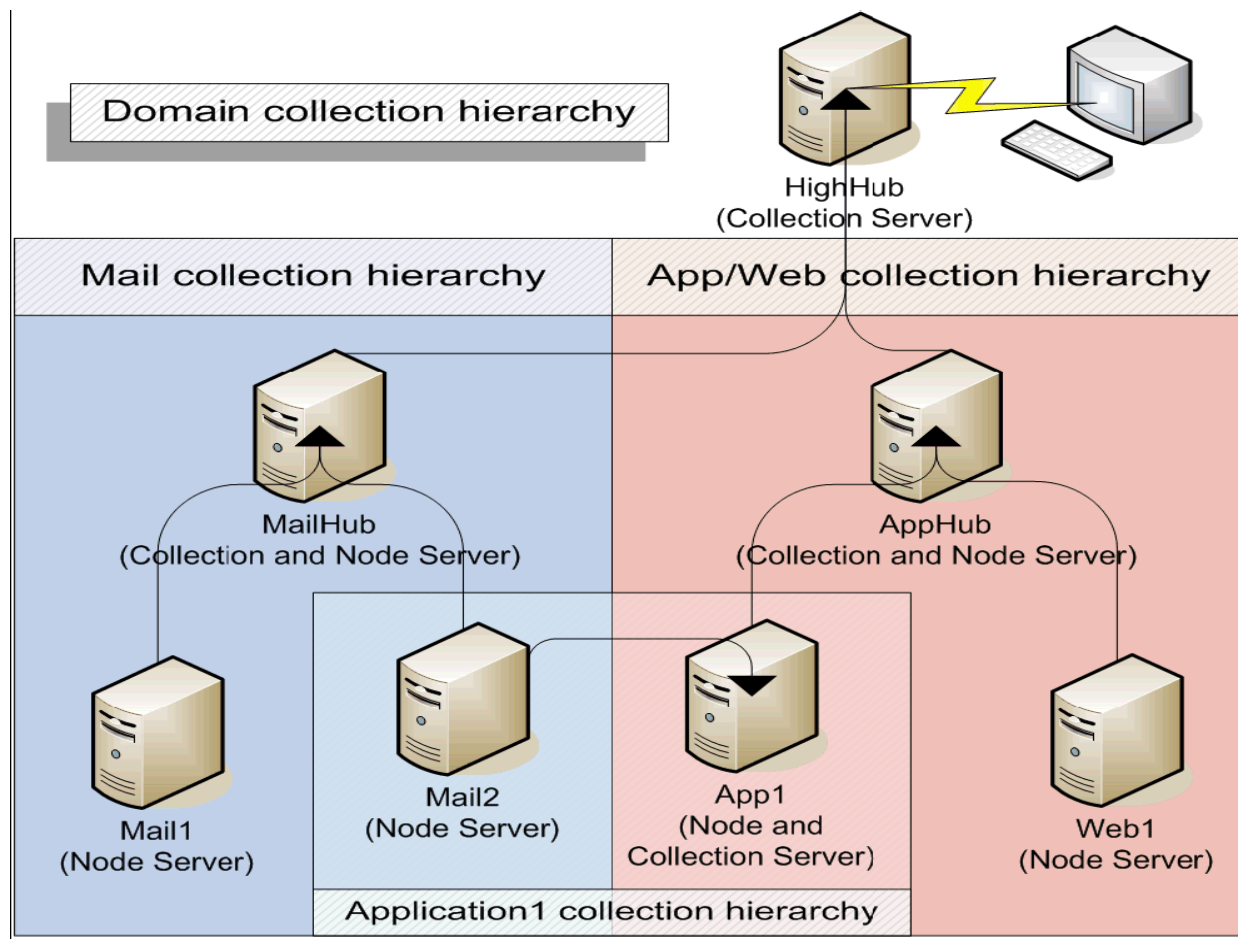
chy Delete Server Collection Hierarchy Change Collecting Server

is

Iris

Little-Village/Iris
Jethro/Iris

Server Collection Hierarchy



Select Hierarchy: Assigned Servers

- Clapton/Iris
 - Eric/Iris
 - Frog/Iris
 - Fish/Iris
 - Chicks/Iris
 - Little-Village/Iris
 - Garfunkle/Iris
 - Ella/Iris
 - Dixie/Iris
 - Brooks/Iris
 - Haku/Iris
 - Glimmer/Iris
 - Garth/Iris
 - Azure/Iris
 - Ace/Iris

Server Collection Hierarchy

- Servers generate report documents into their own ddm.nsf
- Reports are automatically replicated between the parents and children, as defined in the hierarchy
- Which documents show up on which replica of ddm.nsf is defined by the union of all server collection hierarchies in the domain
- The selective replication formula for each ddm.nsf is automatically defined and updated according to this hierarchy union

The screenshot shows the DDM interface with a left-hand navigation pane and a main event list. The navigation pane includes options like 'My Events', 'By Severity', 'By Date', 'By Type', 'By Server' (selected), 'By Assignment', 'Open Configuration', and '1. Debug: Events By'. The main pane shows 'Open Events' with a sub-header 'All open events, sorted by server'. Below this are buttons for 'Refresh', 'Assign...', 'Change State', and 'Add Comments...'. The event list table has columns for '#', 'Date', and 'Open Events By Server'. The list contains various server names and event counts, such as 'Aretha/Iris' (151), 'Arista/Iris' (12), 'Azure/Iris' (20), and 'Failure' (716). A red star icon is next to most entries, and a yellow warning icon is next to the 'Failure' entry.

#	Date	Open Events By Server
★ 151		Aretha/Iris
★ 12		Arista/Iris
★ 20		Azure/Iris
★ 2		bgoat.notesdev.ibm.com
★ 1941		bhsurfers.iris.com/Iris
★ 61		blackberry/Iris
★ 2		bluej.pdl.pok.ibm.com
1429		bou/iris
716		Failure
★ 1		Application Code
★ 35		Database
1		Directory
★	Fri 02/10	The Domino Directory search response on t

Collection, the bottom line ...

- Define hierarchies depending on what servers are of interest to particular Domino administrators
- Administrators can go to a single instance of ddm.nsf to work with every report of every server of interest
- Alternatively, administrators can open ddm.nsf on a leaf server of the hierarchy to see reports for only that server

The Five C's of DDM

- Consolidate
 - Track multiple, related errors in a single event report
- Check
 - Assess health of functional areas
- Collect
 - Access all domain wide reports from a single database
- Correlate
 - Locate related reports from other servers
- Correct

Correlation

- When there are multiple servers noticing the same problem, the report document will include a Correlated Events tab
- Select from this embedded view and take action on all these reports at once

Most Recent Event | **Correlated Events** | Prior Events

Correlated by server:

Refresh | Assign... | Change State | Add Comments...

	Date	Server	Correlated Events
	Failure		
<input checked="" type="checkbox"/>	Thu 03/09	Kaonashi/Iris	Unable to replicate
<input checked="" type="checkbox"/>	Thu 03/09	kamaji/iris	Unable to replicate
<input checked="" type="checkbox"/>	Wed 03/08	clapton/iris	Unable to replicate
<input checked="" type="checkbox"/>	Thu 02/09	Frog/Iris	Unable to replicate
<input checked="" type="checkbox"/>	Tue 01/31	garfunkle/iris	Unable to replicate
<input checked="" type="checkbox"/>	Tue 01/31	radiohead.iris.com/iris	Unable to replicate
<input checked="" type="checkbox"/>	Mon 01/30	clapton/iris	Unable to replicate
<input checked="" type="checkbox"/>	Mon 01/30	area51/iris	Unable to replicate
<input checked="" type="checkbox"/>	Wed 01/25	Glimmer/Iris	Unable to replicate
<input checked="" type="checkbox"/>	Fri 11/25/2005	Crash Test Dummy/Iris	Unable to replicate
<input checked="" type="checkbox"/>	Sun 11/20/2005	bhsurfers.iris.com/iris	Unable to replicate

Correlation

- **Avoid confusion ...**
 - These buttons only work on the current document
 - These buttons operate on the documents selected in the embedded view
- **Prevent pain ...**
 - Never use <ctrl-a> in an embedded view because it will select every doc in the parent view, not just those currently displayed in the embedded view!

The screenshot shows the Lotus Notes interface for an event. At the top, a toolbar contains three buttons: 'Reassign...', 'Change State', and 'Add Comments...'. Below this, the 'Open Event' section shows 'Currently assigned to: 1 Demo Correlated'. To the right, metadata is displayed: 'Generated by: Kaonashi/Iris', 'For server: Jethro/Iris', 'in Domain: IRIS', 'Database: -', 'Event class: Enhanced', 'Agent: -', and 'User: -'. Below the metadata are tabs for 'Most Recent Event', 'Correlated Events', and 'Prior Events'. The 'Correlated by server:' section shows a toolbar with 'Refresh', 'Assign...', 'Change State', and 'Add Comments...' buttons. Below this is a table with columns 'Date', 'Server', and 'Correlated Events'. The table contains two rows of correlated events, both with a warning icon and a checkmark.

Date	Server	Correlated Events
Thu 03/09	Kaonashi/Iris	Unable to replicate with server Jethro/Iris: The s
Thu 03/09	kamaji/iris	Unable to replicate with server Jethro/Iris: The s

Correlation, the bottom line ...

- **Some errors are noticed by multiple servers. Therefore, multiple reports are generated for the identical issues.**
- **Collection servers have replicas of all those multiple reports (if collecting from those reporting servers)**
- **Those identical reports are grouped together under the reports correlated tab**
- **Assign, Annotate or change the state of all the reports with at once**

The Five C's of DDM

- Consolidate
 - Track multiple, related errors in a single event report
- Check
 - Assess health of functional areas
- Collect
 - Access all domain wide reports from a single database
- Correlate
 - Locate related reports from other servers
- Correct
 - Assess knowledge base of explanations and recommendations.
 - Click to resolve issues

Correction Leverages Knowledge

- The Event Report explanation tab optionally has additional details about the error, like ...
 - The link to the probe that caused the error to be generated
 - The Server task that generated the error
 - A link to the message document associated with the error (more on that in a minute)

Thursday, March 09, 2006 - 1:13:41 AM

(2 occurrences, first seen at Wednesday, March 08, 2006 - 1:13:40 AM)

Agent Manager: 12 minute(s) have elapsed since start of agent 'OutOfOffice|OutOfOffice' in database 'mail\MMcGover.nsf'. Threshold level 10 minute(s). Agent Owner: 'Martha McGovern/Westford/IBM'.

Explanation

• Triggered by:



• Triggered by:

Agent Manager

• Severity and type:



Fatal in Application Code



• Probable cause:

An agent is running longer than the threshold specified in the probe configuration.

• Possible solution:

1. Cancel the agent 'OutOfOffice|OutOfOffice' in database 'mail\MMcGover.nsf' on server 'Chicks/Iris' from the server console or from the Administrator Client using "tell amgr cancel "mail\MMcGover.nsf" 'OutOfOffice|OutOfOffice' " console command. (Agent Manager agents only)
2. Examine agent performance by profiling it. To enable profiling edit the agent and then select 'Profile this agent' option on the second tab of the agent's properties. The next time this agent will run it will generate profile information which can be viewed from Designer's Agent menu by selecting 'View profile results'
3. Send a message to the agent owner 'Martha McGovern/Westford/IBM'

• Corrective action:

Choose Solution...

Correction Leverages Knowledge




- Probable cause = 0, 1 or more reasons why this might have happened
- Possible solution = 0, 1 or actions that might resolve the situation
- Corrective action = 0, 1 or more clickable resolutions or helper actions

Thursday, March 09, 2006 - 1:13:41 AM

(2 occurrences, first seen at Wednesday, March 08, 2006 - 1:13:40 AM)

Agent Manager: 12 minute(s) have elapsed since start of agent 'OutOfOffice|OutOfOffice' in database 'mailMMcGover.nsf'. Threshold level 10 minute(s). Agent Owner: 'Martha McGovern/Westford/IBM'.

Explanation

- Triggered by: 
- Reported by: Agent Manager
- Severity and type:  Fatal in Application Code 
- Probable cause: An agent is running longer than the threshold specified in the probe configuration.
- Possible solution:
 1. Cancel the agent 'OutOfOffice|OutOfOffice' in database 'mailMMcGover.nsf' on server 'Chicks/Iris' from the server console or from the Administrator Client using "tell amgr cancel "mailMMcGover.nsf" 'OutOfOffice|OutOfOffice' " console command. (Agent Manager agents only)
 2. Examine agent performance by profiling it. To enable profiling edit the agent and then select 'Profile this agent' option on the second tab of the agent's properties. The next time this agent will run it will generate profile information which can be viewed from Designer's Agent menu by selecting 'View profile results'
 3. Send a message to the agent owner 'Martha McGovern/Westford/IBM'
- Corrective action:

Correction Leverages Knowledge

- Probable cause = 0, 1 or more reasons why this might have happened
- Possible solution = 0, 1 or actions that might resolve the situation
- Corrective action = 0, 1 or more clickable resolutions or helper actions
 - There may be multiple choices under a single button. The number of corrective action choices may not match the number of possible solutions offered.

Thursday, March 09, 2006 - 1:13:41 AM

Agent Manager: 12 minute(s) have elapsed since ...
minute(s). Agent Owner: 'Martha McGovern/Westford/IBM'

Explanation

- Triggered by:
- Reported by: Agent Manager
- Severity and type: Fatal in Application Co...
- Probable cause: An agent is running longer than the threshold specified in the probe configuration.
- Possible solution:
 1. Cancel the agent 'OutOfOffice|OutOfOffice' in database 'mail\MMcGover.nsf' on server 'Chicks/Iris' from the server console or from the Administrator Client using "tell amgr cancel "mail\MMcGover.nsf" 'OutOfOffice|OutOfOffice' " console command. (Agent Manager agents only)
 2. Examine agent performance by profiling it. To enable profiling edit the agent and then select 'Profile this agent' option on the second tab of the agent's properties. The next time this agent will run it will generate profile information which can be viewed from Designer's Agent menu by selecting 'View profile results'
 3. Send a message to the agent owner 'Martha McGovern/Westford/IBM'
- Corrective action:

Fix agent 'OutOfOffice | OutOfOffice' in 'mail\MMcGover.nsf' on server C

Choose an action

- Issue command to cancel the agent OutOfOffice|OutOfOffice
- Open the database to examine the agent
- Send message to the agent designer Martha McGovern/Westford/IBM

OK Cancel




Correction Leverages Knowledge



- Some event reports include two errors. The second one being the 'root cause'.
- Sometimes both errors have associated cause, solution and action information

Tuesday, November 15, 2005, 12:01:26 AM


Unable to replicate names.nsf: Replication cannot proceed because cannot maintain uniform access control list on replicas

Explanation

- Triggered by: 
- Reported by: Replicator
- Root cause: "Replication cannot proceed because cannot maintain uniform access control list on replicas"
- Severity and type:  Warning High in Replication 
- Probable cause: The User ID being used to replicate does not have the required ACL privileges to replicate the database.
- Possible solution: Check the ACL privileges of the replicating User ID or disable the setting "Enforce a consistent ACL across all replicas" in the Advanced ACL settings.
- Corrective action:

- Event: "Unable to replicate names.nsf"
- Severity and type:  Warning High in Replication 
- Probable cause: The secondary event/error describes the reason for the database replication failure.
- Possible solution: See additional error information for this failure in the Domino Administrator. Locate the information by clicking the Replication tab and then open the Replication Events view.
- Corrective action:






CREATE



Correction Leverages Knowledge

- The knowledge database is the collection of message documents in events4.nsf
- The Severity and type, Probable cause, Possible solution and Corrective action for this error is stored in a single message document
- Follow the link to examine or modify that document
- (Of course, message config docs are accessible from events4.nsf views, too)

Explanation

- Triggered by: 
- Reported by: Replicator
- Root cause: "Replication cannot proceed because cannot maintain uniform access control list on replicas"
- Severity and type:  Warning High in Replication 
- Probable cause: The User ID being used to replicate does not have the required ACL privileges to replicate the database.
- Possible solution: Check the ACL privileges of the replicating User ID or disable the setting "Enforce a consistent ACL across all replicas" in the Advanced ACL settings.
- Corrective action:
- Event: "Unable to replicate name.nsf"
- Severity and type:  Warning High in Replication 
- Probable cause: The secondary event/error describes the reason for the database replication failure.
- Possible solution: See additional error information for this failure in the Domino Administrator. Locate the information by clicking the Replication tab and then open the Replication Events view.
- Corrective action:

Knowledge Defined in Message Documents

- Since we're looking at message docs, let's cover the entire thing ...
- Customers are encouraged to change Severity and Suppression time, if necessary
 - Future instances of this error will have the new severity (existing history is not changed)
 - Suppression will prevent alarms from being triggered by multiple occurrences of this error for the specified period of time. (Alarms have been around for many releases)

Basics | Probable Cause/Possible Solution | Corrective Action(s)

Original text: Warning: Cannot locate design note '<string>' in '<string>' template

Addin name:

Value: 0x300D

Event type: Database

Event subtype: Design

Old Event type: Misc

Event severity: Warning (high)

Suppression time: 0 minutes

Event correlation: Server and Database wide correlation

- The remainder of “Basics” is for Domino developers, only

- Error string is here for reference, only. Real strings are resourced.
- Addin name & Value is the ID of this message document
- Old Event type is pre-D7 type, and still supported via Notes C API
- Event type & subtype are new in D7
- The Correlation setting defines how to locate similar reports that have been generated on other servers

Knowledge Defined in Message Documents

- Probable Cause & Possible Solution text is also defined in the message documents
- Customers are free to add to this text as they see fit.
 - We currently have about 10% of the ~6900 message document populated with Probable Cause & Possible Solution text

The screenshot shows a form with three tabs: 'Basic', 'Probable Cause/Possible Solution', and 'Corrective Action(s)'. The 'Probable Cause/Possible Solution' tab is selected and highlighted with a red border. It contains two text areas: 'Probable cause:' with the text 'The number of messages sent to this destination is excessive. The destination server may be unreachable over the network or the server may be down. The details tab lists any errors encountered when attempting to access the destination.' and 'Possible solution:' with the text 'Verify that the destination server can be reached via the network. Configure a mail probe to quickly detect a nonresponding server. Verify that any Connection document to this destination is enabled. Verify that the number of messages required before routing occurs is less than the configured probe limit.' Below these is a 'User comments:' text area, also highlighted with a red border.

- User Comments will show up in the event reports, if populated in the message document.
 - All User Comments are shipped blank

Knowledge Defined in Message Documents

- Corrective Actions are also defined in the message documents
- Actions can be written as a formula or in Lotus Script (but not both)
- Any event report note item referenced from the formula or LS will be replaced with the contents of that note item.

Basics | Probable Cause/Possible Solution | **Corrective Action(s)**

Corrective Formula: `@Name([Abbreviate];"%TargetServer%");
OrigServ := "%OriginatingServer%";
DB := "events4.nsf";
PS1:= "Create mail routing probe";
PS2:= "Examine connection document";
REM { Strings to use for display };
REM { BEGIN OK To Translate };
_sTitle := "Corrective Action Error";`

Corrective LScript:

- We currently have about 1% of the ~6900 message document populated with corrective actions
 - Users are encouraged to create their own corrective actions

Corrective Actions

- **Types of Corrective Actions shipping with D7.0**
 - Security Change (e.g. ECL or ACL dialog box)
 - Configuration Change (e.g. modify values of notes.ini, directory, etc.)
 - Application Change (e.g. add/remove db, enable/disable agent)
 - Initiate (e.g. agent, task, compact, fixup)
 - Terminate (e.g. agent, task)
 - Restart (e.g. task, process)
 - Reset data (e.g. clear replication history)
 - Notification (e.g. compose an e-mail)
 - Navigation to something that could be examined (e.g. Lotus Script profiling, a database view, etc.)

Correction, the bottom line ...

- Knowledge pertaining to error conditions is stored in events4.nsf message documents
- This knowledge is displayed in an event report as probable cause text, possible solution text and clickable corrective actions
- Customers are encouraged to extend this knowledge base by editing events4.nsf message documents

Beyond the Five C's of DDM

- DDM Filters

DDM Filters

- **7.0 event filters control what and how much information is reported to ddm.nsf. Why?**
 - Initial flood of events is striking, many of which have always been there
 - Over time, administrators will want to “adjust the volume”, seeing more or less of certain events
- **Enhanced and simple events can be filtered.**
- **Filters can target specific servers and filter out events by event type/area and severity**
- **A default filter is supplied and enabled for simple events to reduce the initial “noise”.**

DDM Filters

- Defined in events4.nsf
- Can target specific servers
- Can filter both enhanced and simple events, or just simple events
- Can filter all event types by severity
- Can filter specific event types by severity

Description:
hpeebles7 simple code & db

Event Filter:
 Apply filter to enhanced and simple events
 Only apply filter to simple events

Event Types and Severities to Log:
 Log All Event Types Log Selected Event Types

<input checked="" type="checkbox"/> Application Code	<input checked="" type="checkbox"/> All Severities	<input checked="" type="checkbox"/> Fatal	<input checked="" type="checkbox"/> Failure	<input checked="" type="checkbox"/> Warning (high)	<input checked="" type="checkbox"/> Warning (low)	<input checked="" type="checkbox"/> Normal
<input checked="" type="checkbox"/> Database	<input type="checkbox"/> All Severities	<input checked="" type="checkbox"/> Fatal	<input checked="" type="checkbox"/> Failure	<input checked="" type="checkbox"/> Warning (high)	<input type="checkbox"/> Warning (low)	<input type="checkbox"/> Normal
<input type="checkbox"/> Directory	<input type="checkbox"/> All Severities	<input type="checkbox"/> Fatal	<input type="checkbox"/> Failure	<input type="checkbox"/> Warning (high)	<input type="checkbox"/> Warning (low)	<input type="checkbox"/> Normal

All servers in the domain

7 Key Points to Take Home

- DDM is aimed at TCO reduction and all administrators
- One-stop shopping for monitoring and problem resolution
- Distills and correlates a huge amount of otherwise indigestible data
- Highly usable interface allows systematic approach to server issues
- Configurability and flexibility accommodates diverse enterprises
- More efficient monitoring and problem resolution leads to:
 - Server stability and uptime
 - Focus on business needs, not the mechanics of administration
- DDM should become primary monitoring interface, but it's optional!
- DDM architecture facilitates future extensibility and programmability

Agenda

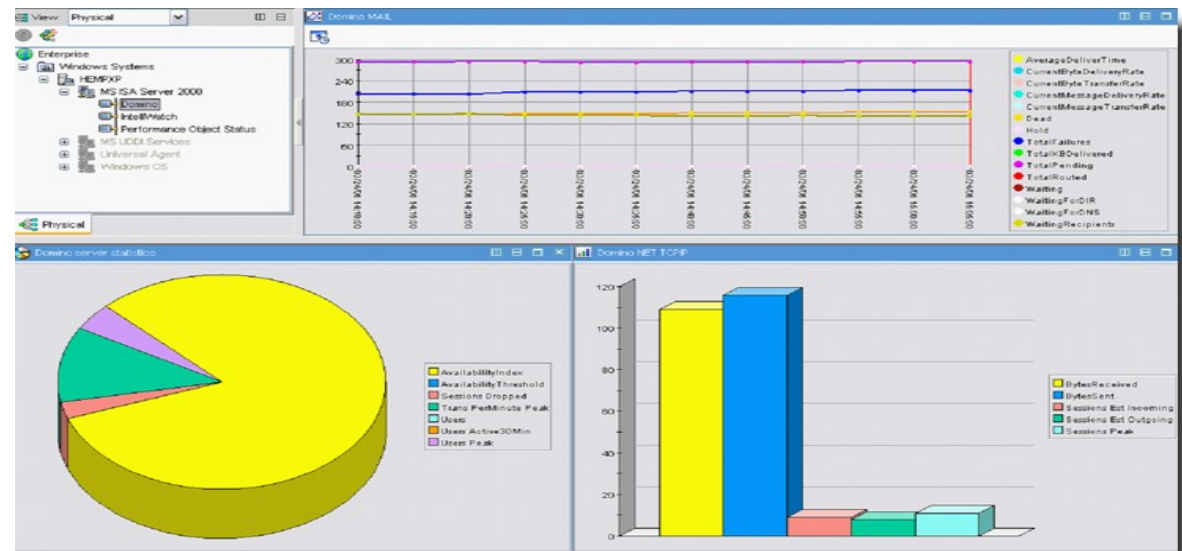
- Server monitoring and analysis
- Domino Domain Monitoring
- Custom Monitoring and Third-Party Products

Custom monitoring

- Event Handlers
- Shell/batch scripts to monitor ASCII Domino console log output
- C/C++ API Toolkit to access Domino database components
- Java/COM/OLE/LotusScript to access the Notes and Domino environment

IBM Tivoli Composite Application Manager(ITCAM) for Applications Monitor your entire application environment

- ITCAM for Applications – Domino agent
 - Local or Remote monitoring of Domino Servers
 - Remote monitoring for Domino servers within the same domain
 - Performance Monitoring information on key Domino server components
 - Mail
 - Replication
 - Calendar
 - Database
 - Clusters
 - Out of box Domino performance reports
- Domino deep dive capabilities with IntelliWatch
 - Ability to visualize Intelliwatch data in TEP



Lotus knows.

Remember software that is *Simple* *Powerful*.

Questions?



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