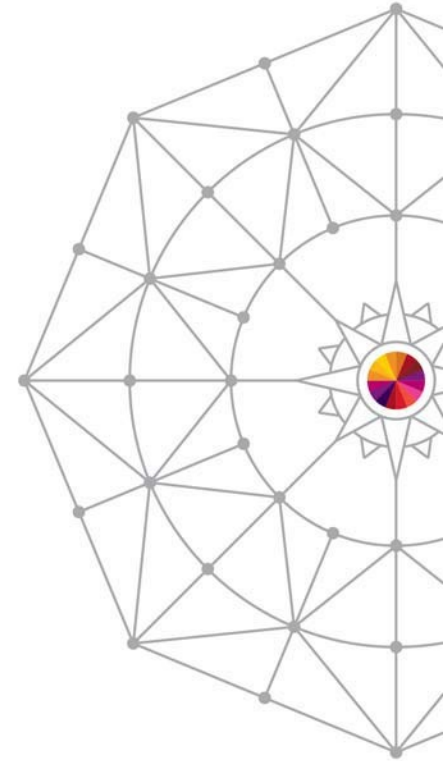


z/OS Connect and IBM Mobile Workload Pricing

*Ian J Mitchell,
IBM Distinguished Engineer, System Z
Middleware CTO*



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*Session 16278
Wednesday 6th August 2014*



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APIs - the building blocks for apps

Application Programming Interface

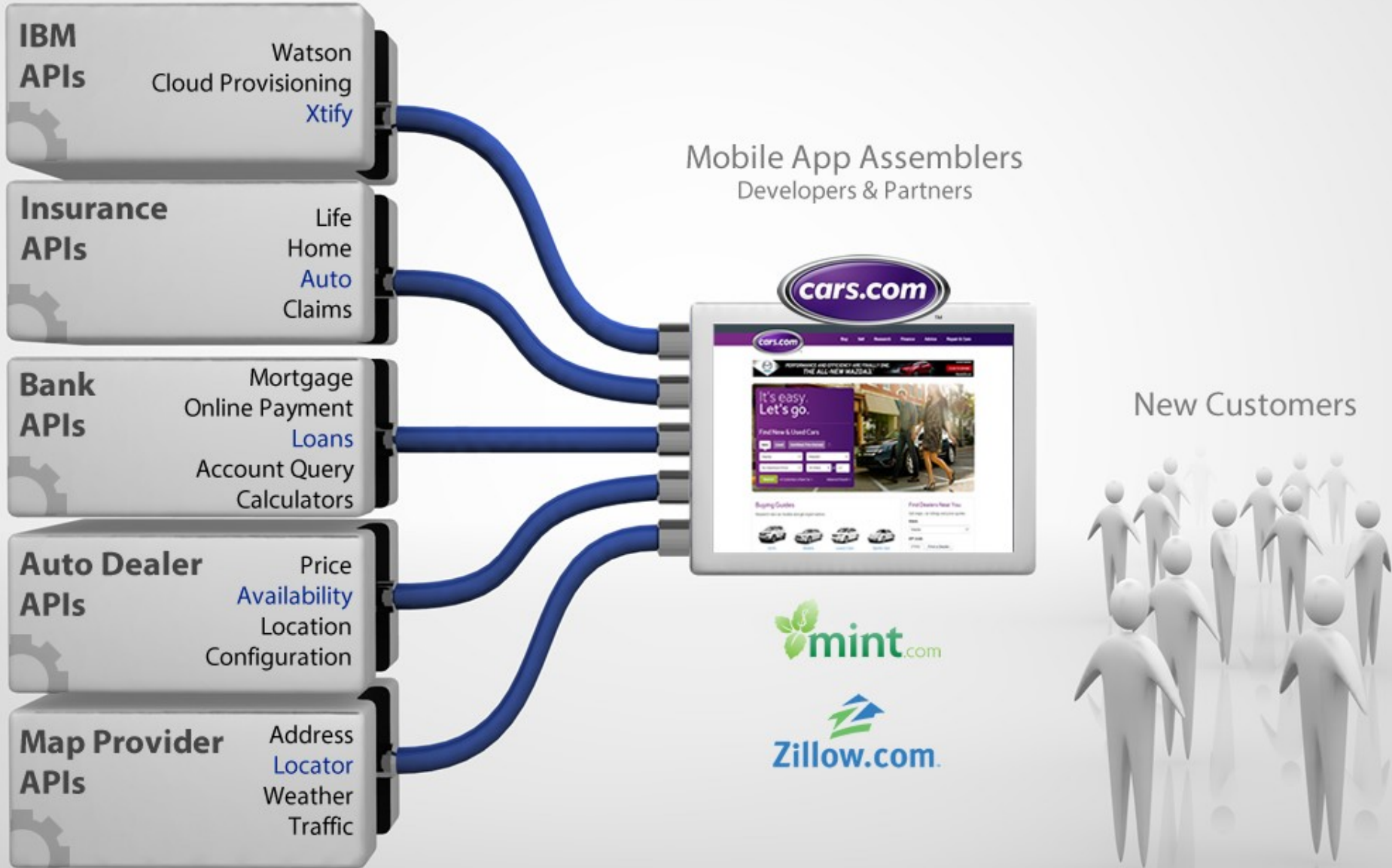
The **“API economy”** has changed how developers think about building apps, and how organizations deploy software in the cloud

Bank Externalized Services



API Economy

Mobile App Assembly



API Economy

Mobile App Assembly

IBM APIs

Watson
Cloud Provisioning
Xtify

Insurance APIs

Life
Home
Auto
Claims

Bank APIs

Mortgage
Online Payment
Loans
Account Query
Calculators

Auto Dealer APIs

Price
Availability
Location
Configuration

Map Provider APIs

Address
Locator
Weather
Traffic

Mobile
Development

Consumers

Benefits for Application Assemblers

- Quick time to Market by using existing assets and services to decrease costs and speed up product and service development
- Driving innovation by capitalizing on the merging of capabilities provided by different APIs
- Attracting clients to your products and services by joining other (established) API ecosystems
- Potentially having freedom of choice in terms of available APIs (avoiding vendor lock-in)
- Focus on core competence and value add rather than reinventing common capabilities
- Create new business opportunity from APIs
- Innovate around business models and reach new customers from the provider's ecosystem

Providers

API Economy

Provider Perspective

Mobile App Assemblers

Developers & Partners

IBM APIs
Watson
Cloud Provisioning
Xtify

Insurance APIs
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Bank APIs
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New Customers



Providers

Consumers

API Economy

Provider Perspective

Mobile App Assemblers

Developers & Partners

Providers

Benefits

- Expanding into new customer bases and niches that you normally wouldn't be able to reach on your own
- Focusing on your core value
- Expanding your brand and brand loyalty
- Easier possibilities in establishing new partnerships and capitalizing on them
- Benefitting from open innovations of crowdsourcing and expert sourcing, which are implicitly unlocked through the opening of APIs
- Realize profit from new business models
- Decreased development costs and time through software (e.g., mobile apps) produced by third parties
- Keeping up with application demands (e.g. new apps, new features)
- Wider and quicker coverage of different platforms and devices

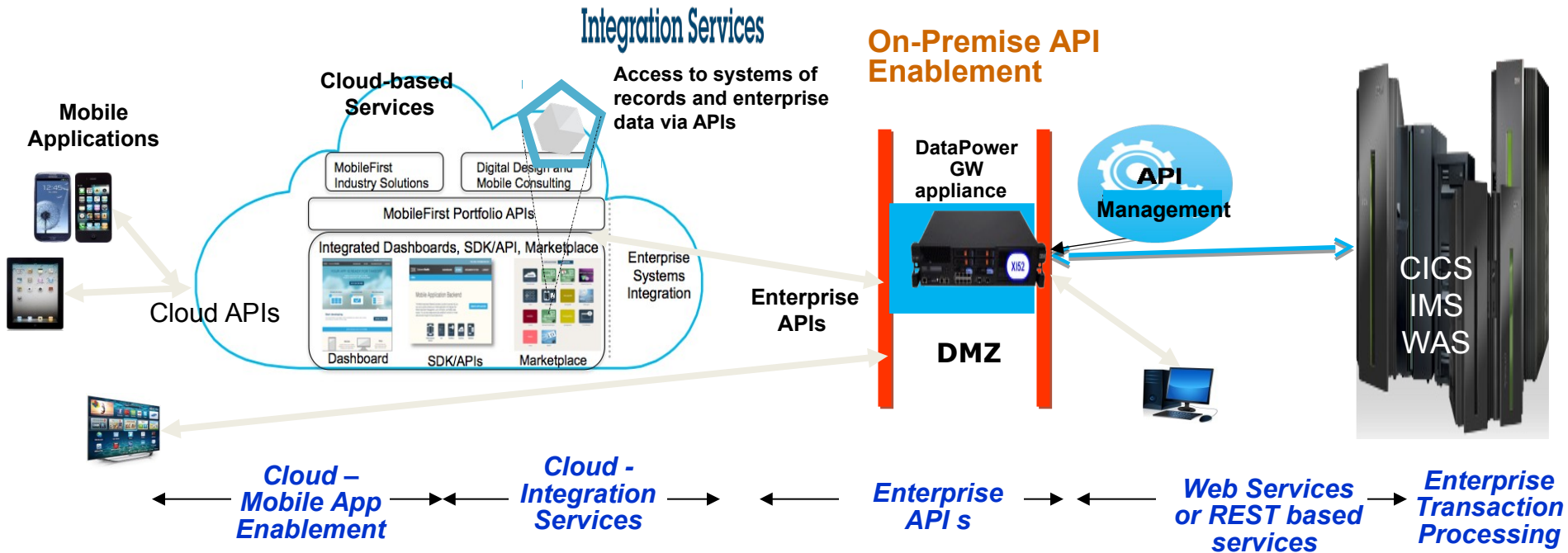


New Customers



Consumers

End-to-End Architecture for Mobile and Cloud Application invoking z Services using APIs



Mobile Application Development
• Invokes services and APIs

Cloud Integration Enablement:
• Enabling integration with APIs as well as technical services

API Enablement:
• Consumability by internal and external developers (creation and look up)
• Entitlement Management (securing, workload enforcement)
• Usage monitoring & Analytics

Service Enablement:
• Enables invocation of z applications by remote applications using standard protocols (WSDL, REST)

WebSphere Liberty Profile – What's New ?



Extend existing enterprise data and business logic to **Web, Mobile or Cloud** apps

- Use **WebSphere Liberty z/OS Connect** for secure enterprise connectivity to easily extend existing assets to Mobile and Cloud applications using RESTful services and JSON.
- Leverage **WebSphere Liberty Java Connector Architecture (JCA)** feature to connect in to and extend existing enterprise backend systems
- **IBM WebSphere Liberty Optimized Adapters for z/OS (WOLA)**: a function of WAS Liberty for z/OS that allows very fast, efficient, and low-latency memory to memory exchanges between WAS z/OS and CICS, IMS & Batch.

Administer production apps with the **WebSphere Liberty Administrative Center**

- Flexible, extensible, mobile ready, next generation admin UI to manage Liberty Servers

WebSphere Liberty Repository to pick up new Liberty product features, samples, and tutorials:

- Easily extend your development and production environments with new features

Different options for using **WebSphere Liberty in the Cloud**

- Build applications using the Liberty Buildpack and Caching services on IBM BlueMix
- Deploy WAS Liberty patterns using Pure Application Pattern service on SoftLayer
- Bring your own existing entitlement of WAS to SoftLayer or Amazon cloud environments



Problem Statement (s)



Customers on the z/OS platform today are increasingly expressing concerns about their ability to handle large spikes of new requests originating from any number of almost instantly available clients and systems that have a need for the business assets available there.

The fast advancing worlds of mobile and cloud computing are putting more and more pressure on applications and business logic located on z/OS in environments like CICS, IMS, batch, and others.

Customers have expressed an interest in a common solution that can be used by cloud, mobile, web and components like API management, that enables simple discovery and secure access to z/OS business and infrastructure assets using REST technology.

Infrastructure providers (cloud-based IaaS and SaaS providers) and mobile services registries (ie: API Management) require a uniform way to interact with z-based middleware for discovery, provisioning, data transformation, and service invocation.



z/OS Connect



What is it and what are the benefits for customers?

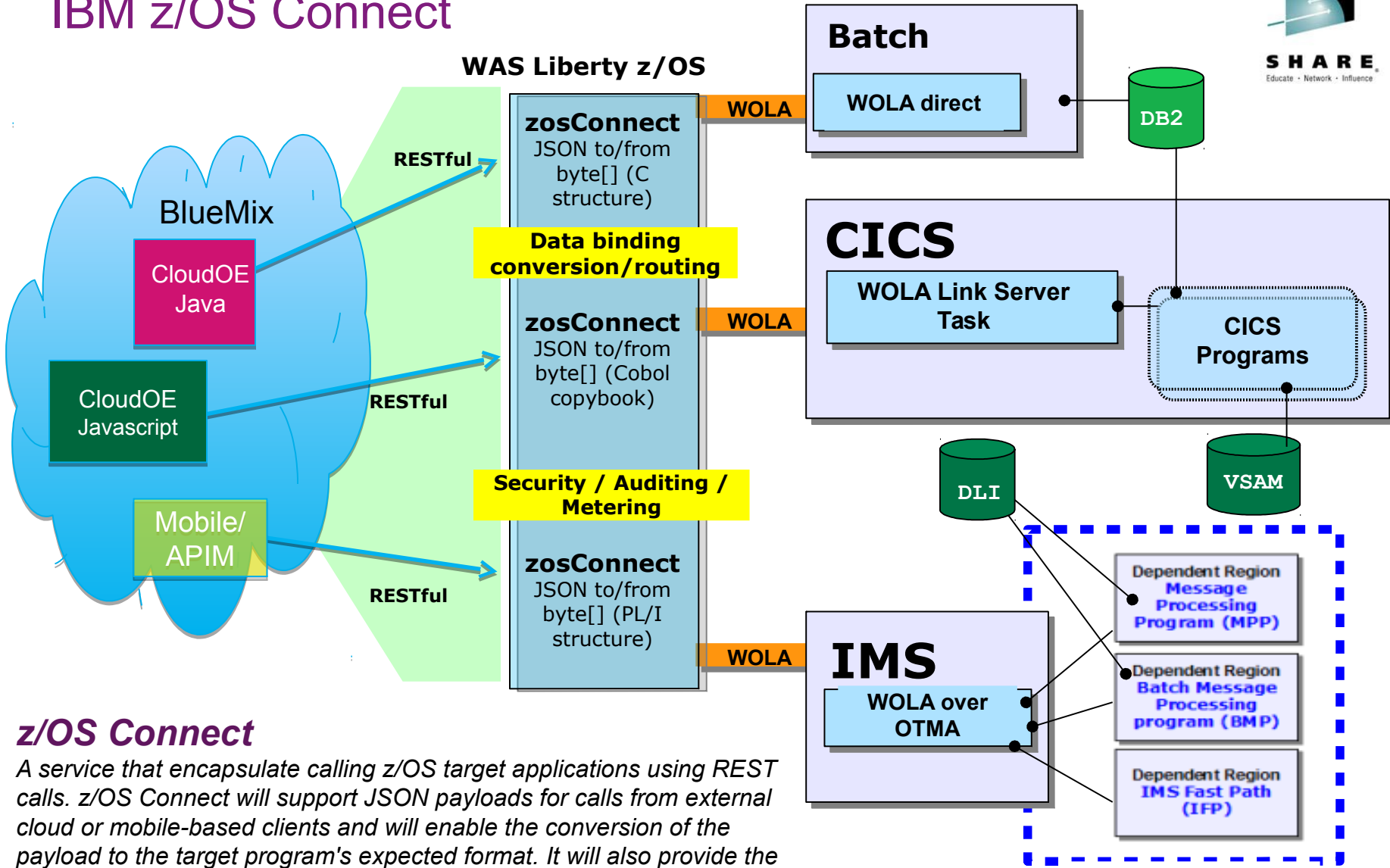
z/OS Connect is a Liberty based gateway that provides a secure and simple way to discover and call in to application assets/infrastructure on z/OS from Web/Cloud/Mobile applications using RESTful services.

The benefits include :

- Fast on-ramp for z/OS customers to **discover and reach z/OS applications** securely/simplely using RESTful services. Service references can be copied from z/OS Connect and stored in any repository – cloud based (such as IBM Cloud OE) or mobile based (such as IBM Worklight, API Management) or any other web technology
- **Light-weight and modular** providing flexibility to run multiple copies on the same or different z/OS systems and assign higher/lower priority to specific Liberty servers
- **Integrated with z/OS management** makes the operations of the environment automated and consistent with the environments it is exposing
- Provides ability to standardize on security access for calling in to z/OS applications in all major environments - CICS, IMS, batch, Unix System Services, and ISV software. Supports SAF-based security integration allowing **for individual z/OS Connect services** to have unique sets of authorized users.
- Provides ability **to track and prioritize requests** from cloud, mobile, web based external requestors using standard z/OS mechanisms like SMF and WLMA. Fulfills audit/chargeback needs for access to z/OS applications



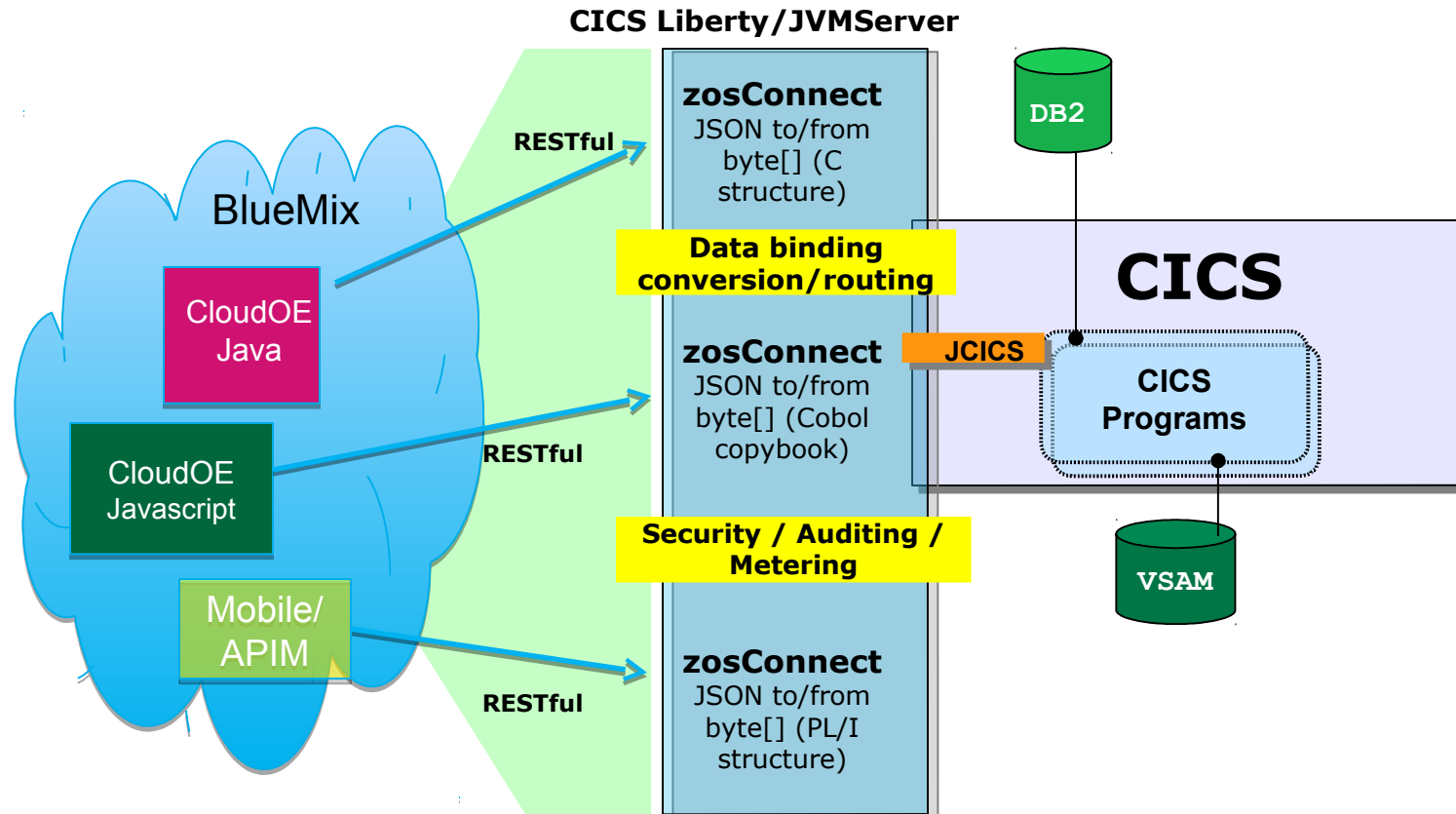
IBM z/OS Connect



z/OS Connect

A service that encapsulate calling z/OS target applications using REST calls. z/OS Connect will support JSON payloads for calls from external cloud or mobile-based clients and will enable the conversion of the payload to the target program's expected format. It will also provide the response payload conversion from a byte array into JSON format before returning the response to the caller.

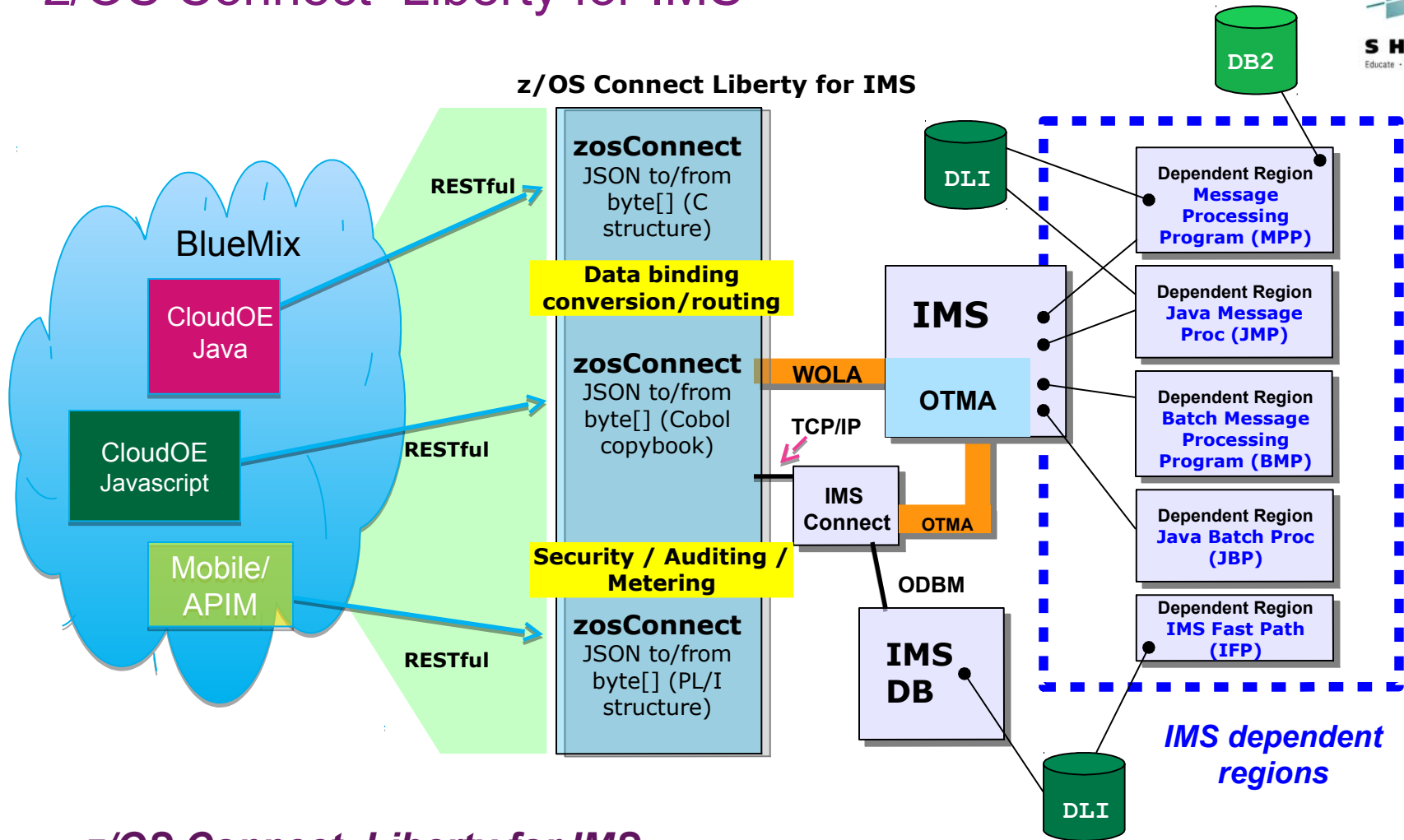
z/OS Connect Liberty under CICS



z/OS Connect under CICS Liberty

Same z/OS Connect implementation – the CICS JCICS service provider handles requests targeted to existing CICS programs. CICS provides interceptors to integrate z/OS Connect with CICS security

z/OS Connect Liberty for IMS



z/OS Connect Liberty for IMS

Same z/OS Connect implementation – WOLA or the IMS Connect service provider handles requests targeted to existing IMS transactions and data.



Agenda:

- z/OS Connect... Mainframe Makes Mobile Magic
- Mobile Workload Pricing
- What's going on in CICS TS with IBM Design Thinking?

Mobile Workload Pricing for z/OS

▪ Benefits

- Improves the cost of growth for mobile transactions processed in System z environments such as CICS, IMS, DB2, and WAS
- Mobile Workload Pricing (MWP) for z/OS enhances Sub-Capacity pricing
 - Mitigates the impact of Mobile on MLC charges where higher transaction volumes cause a spike in machine utilization
 - Normalizes the rate of transaction growth
- No infrastructure changes required, no separate LPARs needed
 - It is an enhanced way of reporting sub-capacity MSUs
 - System runs as it always has, workload execution is not altered

▪ Hardware requirements

- Available to all enterprises running a zEC12 or zBC12 server (actual mobile work may run on any zEnterprise machine including z196 and z114)

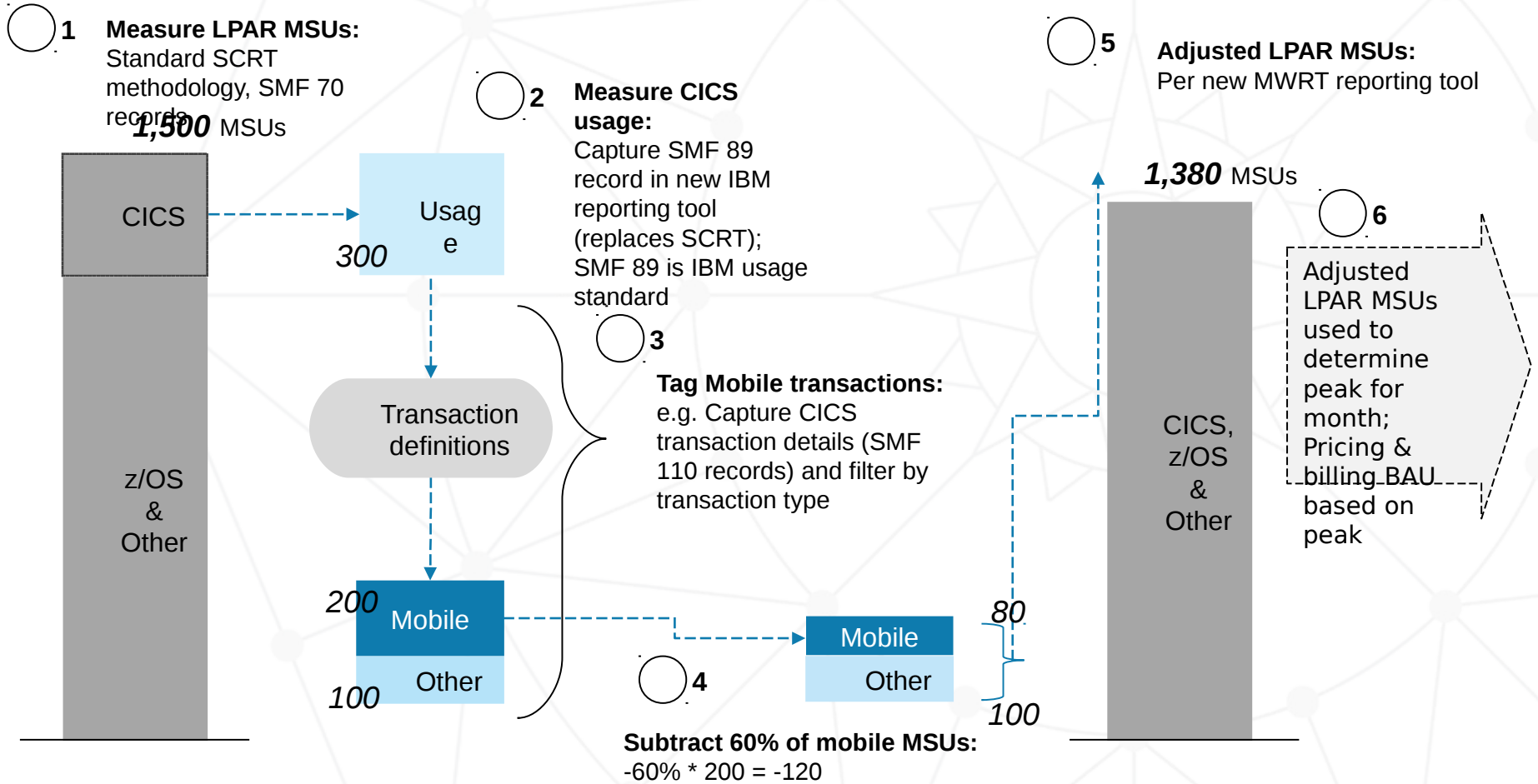
▪ MWP Announcement Letters – 2014-05-06

- | | | | |
|-------------|-----------------------------|-------------|---------------|
| • AP14-0219 | Asia Pacific | • JP14-0279 | Japan |
| • A14-0429 | Canada | • LP14-0279 | Latin America |
| • ZP14-0280 | Europe, Middle East, Africa | • 214-223 | United States |

Mobile Workload Pricing Reporting Process

- New Mobile Workload Reporting Tool (MWRT) – available 30 June 2014
 - A new Windows-based Java tool to report sub-capacity MSUs and make adjustments to reported LPAR MSUs based on Mobile transaction data
 - Standard SCRT methodology plus new feature to adjust for Mobile workload impact
 - New tool will replace SCRT for customers who take advantage of Mobile Workload Pricing
- Customers must track mobile transactions and produce a file showing mobile CPU consumption each month
 - Record mobile program transaction data, including CPU seconds, on an hourly basis per LPAR
 - Load the resulting data file into MWRT each month (IBM-specified CSV format)
 - Run MWRT and submit the results to IBM each month (Replaces SCRT process)
- MSU adjustments and monthly peak calculation for billing
 - MWRT will subtract 60% of the reported Mobile MSUs from a given LPAR in each hour, adjusting the total LPAR MSU value for that hour
 - This will function like a partial “off-load” from a software pricing perspective
 - When an LPAR value is adjusted, all software running in the LPAR will benefit from lower MSUs
 - Tool will calculate the monthly MSU peak for a given machine using the adjusted MSU values

Example: reducing Mobile impact to LPAR peak



LPAR MSUs for billing (Standard)

z/OS/Other	1,500
CICS	1,500

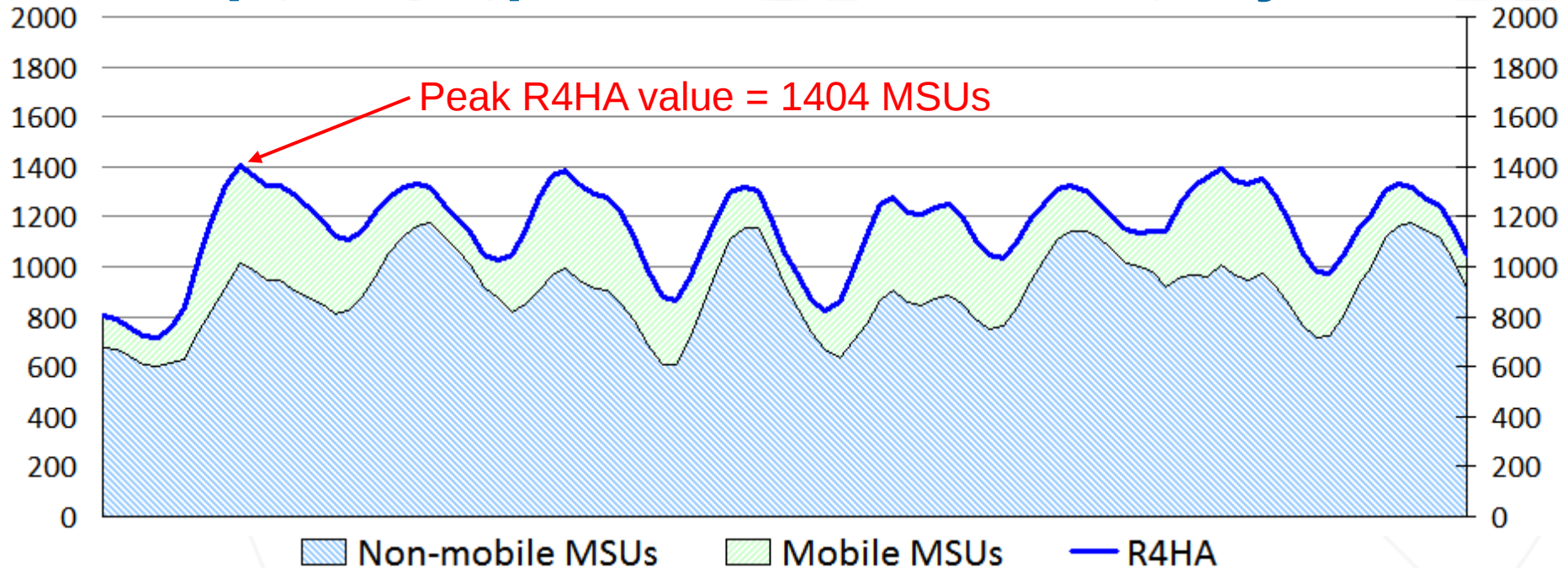
LPAR MSUs for billing (Adjusted)

z/OS/Other	1,380
CICS	1,380

Figures are for illustrative purposes only.

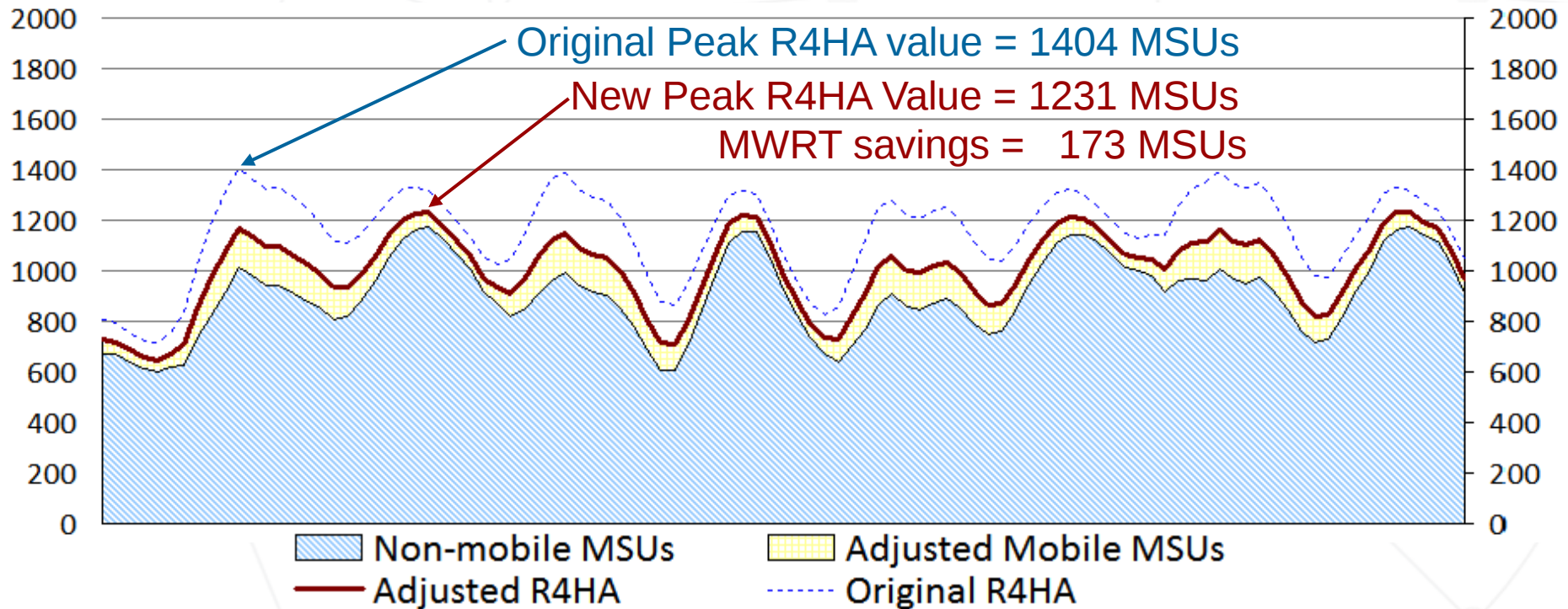
Example: Sample LPAR MSU values by hour

18



- SCRT calculates the Rolling 4-Hour Average (R4HA) MSU peak
 - All workloads are included

LPAR MSU values adjusted for mobile contribution



- MWRT removes 60% of the Mobile workload, interval-by-interval
 - Non-mobile workload is unchanged
 - Billing for the month is based upon the newly calculated R4HA curve after the mobile workload has been reduced

***Provides benefit when Mobile workloads contribute to monthly peak MSUs;
Off-peak MSU adjustments will not affect MSUs used for billing.***

Identifying Mobile Transaction Workload

- Customers are responsible for processing their mobile transaction data into a predefined format to be loaded into MWRT for each sub-capacity reporting period.
 - IBM must approve the data gathering methodology.
- The data must consist of **general purpose processor CPU seconds** for each mobile transaction program summarized by hour by LPAR for all machines processing mobile transactions.
 - Detailed instructions, including CSV file format, available in the MWRT user's guide.
- Mobile Workload Pricing Defining Programs:

5655-S97	CICS TS for z/OS V4	5635-A04	IMS V13
5655-Y04	CICS TS for z/OS V5	5655-DSQ	IMS DB VUE V12
5722-DFJ	CICS VUE V5	5655-DSM	IMS DB VUE V13
5635-DB2	DB2 V9 for z/OS	5655-L82	WS MQ for z/OS V6
5605-DB2	DB2 10 for z/OS	5655-R36	WS MQ for z/OS V7
5615-DB2	DB2 11 for z/OS	5655-W97	WS MQ for z/OS V8
5697-P12	DB2 VUE V9	5655-VUE	WS MQ VUE V7
5697-P31	DB2 10 VUE	5655-VU8	WS MQ VUE V8
5697-P43	DB2 11 VUE	5655-N02	WebSphere App Server for z/OS V7
5635-A02	IMS V11	5655-W65	WebSphere App Server for z/OS V8
5635-A03	IMS V12		

New MWP Contract Addendum

- Mobile Workload Pricing is available for Mobile workloads running on a zEC12 or zBC12 server with AWLC or AEWLC sub-capacity pricing
 - Alternatively, if you install and operate a zEC12 or zBC12 in your enterprise you will be eligible for MWP when running a Mobile Workload Pricing Defining Program on a z196 or z114 server with sub-capacity pricing
- There is a new contract addendum:
 - The System z AWLC and AEWLC Addendum for Mobile Workload Pricing
 - Contract number Z126-6300
- Agreement to and compliance with the terms and conditions specified in the MWP contract Addendum is required
 - If the MWP Addendum is not implemented, MWRT Reports will be rejected!

In Summary

- Mobile Workload Pricing (MWP) Benefits
 - Improves the cost of growth for mobile transactions processed in System z environments such as CICS, IMS, DB2, and WAS
 - MWP for z/OS enhances Sub-Capacity pricing
 - Mitigates the impact of Mobile on MLC charges where higher transaction volumes cause a spike in machine utilization
 - Normalizes the rate of transaction growth
 - No infrastructure changes required, no separate LPARs needed
 - It is an enhanced way of reporting sub-capacity MSUs
 - System runs as it always has, workload execution is not altered
- Key requirements
 - Available to all enterprises running a zEC12 or zBC12 server (actual mobile work may run on any zEnterprise machine including z196 and z114)
 - Use a Mobile Workload Pricing Defining Program to process mobile transactions
 - Implement sub-capacity using AWLC or AEWLC under standard pricing terms
 - Meet the mobile workload tracking and reporting requirements