bathwick group

CICS V5.1:
Learning from the cloud

Author: Gary Barnett
Published: February 2013

Executive Summary

This release of CICS is significant for two primary reasons. Firstly, as you would expect, it delivers enhancements to the core platform that helps to improve the performance and lower the administrative cost of CICS. Secondly, and this is the focus of this report, IBM has taken some of the key features and benefits promised by cloud computing environments and embedded them within the platform.

CICS 5.1 Key Messages

Bringing key attributes of cloud computing to the CICS platform

This release adds a number of features that will be familiar to users of Cloud infrastructure, making the process of provisioning, managing, and accounting for different workloads much easier.

Significantly higher levels of automation

This release allows system administraors to define policies that govern the way transactions are managed. When combined with the enhancements that IBM has made to the CICS deployment assistant, it now requires significantly less administrator effort to clone or deploy applications.

Improved performance

Consolidating CICS region can reduce CPU utilisation by 10%.

Lower Administration Costs

The ability to consolidate regions, and apply policies dramatically lowers the administration burden.

Higher levels of availability

CICS services can be upgraded, and SSL certificates refreshed without disruption.

Existing users of CICS should upgrade, and organisations looking for a high-performance consolidation platform should consider CICS and the System z hardware platform alongside the other alternatives – because, while we don't expect System z and CICS to be the best option in every case, there will be times where the combination of CICS and System z represents a compelling choice.

When it comes to IBM's focus on cloud, it should be clear that IBM isn't claiming that CICS represents a cloud platform in the same way as public cloud services like Amazon EC2. IBM doesn't intend to offer CICS as a like-for-like alternative to the current crop of public cloud offerings, instead it has looked at some of the key benefits offered by these environments and begun the process of incorporating them into CICS.

Lessons learned from cloud computing

Cloud computing embodies a set of ideas that touch on a number of key pain points within many organisations. Whether it is the time it takes to deploy new functionality, the administration burden associated with the management of many servers, or simply the economic case associated with the deployment of new server instances, cloud infrastructure providers like Amazon (EC2) are delivering services that focus on these pain points.

CICS has taken some of the benefits of cloud computing, and embedded them within the platform. This release introduces two new concepts, the *application* and the *platform*. Applications provide a way of packaging all of the components (transaction definitions and resources) that are required for a given application to run. In addition it is possible to define policies for an application. This makes the process of creating a new instance of an application far simpler, as all of the required components, settings, policies etc. can all be set up automatically. The platform extends this further, by defining what we'd describe as a logical container for applications. The platform can also have policies applied to it which are automatically applied to any application that runs within the platform.

Some of the key attributes of cloud computing are:

- **Self-Service**

  The ability to deploy and manage applications without requiring the intervention of a highly skilled systems administrator brings a number of benefits, especially in environments where development teams need to create development and/or test environments frequently. The ability to deploy applications on a self-service basis lowers the time it takes to bring new applications online, and lowers the cost associated with provisioning them.

This release of CICS makes it possible to deploy applications with minimal system administrator intervention, by introducing the concept of *applications*. Applications represent a bundling of the transactions and resources that are required to deliver a specific set of business functions. Rather than managing a host of disparate resources individually, administrators, developers and testers can now manage these resources as a logical whole. So, when an application needs to be deployed, instead of having to gather up all of the components that the application needs in order to run, the application deployer simply needs to request that the application be provisioned, CICS then takes on the task of ensuring that all of the different elements of the application are deployed.

We wouldn't describe the process as completely self-service at this point, as an administrator still needs to set policies, and define the applications that are to be deployed, but once the application has been set up, the task of provisioning a new instance of the application can now be done without the intervention of a systems administrator.

In providing greater levels of self service, both through the platform itself and the surrounding tooling, IBM has to strike a complex balance between the quite justifiable need for high levels of governance and reporting that are typical features of CICS applications with the levels of ease of use promised by other cloud infrastructure. In the world of public cloud, governance is a topic that many providers are just beginning to grapple with, as the consumers of cloud-based infrastructure are increasingly demanding greater control over the way in which their employees use cloud services.

- **Resource Pooling**

  Resource pooling is one of the hallmarks of cloud-based infrastructure, and it lies at the heart of the economic case for cloud computing, the ability to share resources is key to delivering the flexibility and high utilisation that help to make cloud-based infrastructure an attractive proposition.

  This is one area where CICS, coupled with z/OS have always been able to claim strong support long before this release. CICS has provided a secure, managed, multi-tenanted environment for decades now, and this version of the platform builds on this by providing support for policy-based management of transactions. It is now possible to define policies that can trigger an action if a given transaction breaches a defined threshold. These policies can also be adjusted at run-time, making it possible to adjust the way resources are allocated as business demands change. IBM has also introduced the concept of the platform, which allows CICS regions (either existing or new) to be logically grouped. Once grouped, each collection of regions can be managed as a single entity.

  By defining policies, administrators can define automatic responses to a range of different events, for example when application errors occur or certain utilisation thresholds are exceeded.

  In this release, these policies are set at the application or platform level and can be applied to any transaction contained within the application or platform definition. It is not currently possible to assign policies to individual transactions so that they are applied by any application that makes use of the transaction in question.

  Ideally, we'd like to see the ability to outline policies that can be defined at the transaction level, so that they can be inherited by any application that uses the affected transactions.

- **Elasticity**

  The ability to scale up and down is one of the chief features of public cloud infrastructure, and where you need very high levels of elasticity, it is fair to say that public cloud offers significant advantages over private cloud infrastructure, but you need to be clear about the level of elasticity that your application requires. Some e-commerce sites see peaks in demand that are as many as 400 times higher than their normal operating requirements, even with the ability to de-prioritise some applications in favour of others, it's unlikely to be economically viable to retain the ability to scale by a factor of 400 using your own infrastructure.

  But these cases tend to be extreme, with most organisations experiencing much more predictable and much smaller peaks. In most cases, the ability to scale up by 50% when necessary is likely to provide more than enough headroom in the vast majority of cases.

CICS addresses elasticity in a number of ways, firstly by building on the core features of z/OS, which has a long history of resource management that enables the System z platform to regularly achieve levels of utilisation that are almost unheard of in other environments, and secondly through the CICS Workload Manager (WLM) which is able to allocate resources dynamically in the face of fluctuating demand.

By introducing the idea of platforms, it is now possible to combine a number of regions and treat them as a logical pool of resources. Regions can be added to (or removed from) this logical pool at runtime, so additional resources can be made available as demand changes. The addition of regions to a platform isn't automated in this release, and this is another area where we'd like to see IBM develop the core idea further. Ideally we'd like to see the ability to define a platform as being allowed to run between X and Y regions, with policies set in place to determine when regions are added or removed from the platform.

- **Measurement and Billing**

  This is an area where both CICS and z/OS are already well ahead of mainstream cloud providers. Existing cloud infrastructure provides very rudimentary measurement and billing services by comparison to the services that have been present in CICS for decades. It's also worth pointing out that audit is another requirement that sits alongside measurement and billing; for many applications the ability to audit at system level which user or application has accessed a given resource is an essential, and sometimes a legal, requirement. In the world of public cloud, it's down to the developers to build these audit services into the applications, whereas in the world of CICS these services are provided by the platform itself.

  This release of the platform makes it possible to measure the resource utilisation and manage audit requirements at a range of levels, from the individual resource, to a whole application.

  So, while CICS isn't positioned as a direct alternative to the public cloud services that are available, organisations that are looking to cloud infrastructure for the key benefits of automation, lower time to deployment and greater economic clarity could very well find that CICS offers a stable, secure in-house alternative.

Key messages for existing users of CICS

You should begin the process of upgrading to CICS 5.1 and you should begin to look at how your existing applications can benefit from the use of IBM's addition of cloud features.

Upgrading will enable you to deliver more through-put on one hand, while offering the chance to dramatically consolidate workloads and administration tasks on the other. Taking advantage of the cloud-oriented features will enable you to deliver greater levels of agility while maintaining a high degree of control over the platform as a whole.

- **CICS 5.1 offers greater performance across the board for both traditional and non-traditional workloads**

  In internal tests IBM was able to consolidate 30 CICS regions down to 10, lower CPU usage by 10%, and reduce the admin burden by two thirds. For Java, performance has improved by more than a third.

- **CICS 5.1 comes with a new generation of tooling**

  With the release of CICS 5.1 comes new versions of key management tools which, when taken together, will lower the time it takes to manage existing workloads and deploy new ones.

- **CICS 5.1 delivers even greater availability**

  CICS has a long standing reputation as one of the most reliable computing platforms ever built, this release adds to this reputation by allowing more system maintenance tasks (like upgrading CICS itself, or refreshing the SSL environment) without having to take the system off-line.

- **CICS 5.1 adds significantly to the value proposition of System z**

  IBM has been positioning System z as a cost-competitive consolidation platform for database, Linux, and Java workloads for some time; this release strengthens that proposition further.

What's important about this release of CICS?

As we've already made clear, while the improvements that IBM has made to the standard functionality of CICS are very welcome, the most important elements of this release lie in the way that IBM has taken some of the features that lie at the heart of the cloud computing value proposition and applied them to CICS.

What do businesses want?

We regularly conduct surveys of CIOs to establish what their concerns are, and what things they intend to prioritise over the next 12 months. IBM also conducts extensive research into the needs and expectation of its clients through its Institute for Business Value (You can read the IBV reports yourself by visiting http://www-935.ibm.com/services/us/gbs/thoughtleadership/).

Indeed, different research firms and vendor organisations are constantly surveying executives to find out what their priorities are.

If you look across all of this research perhaps the most interesting discovery you'll make is that, while some of the headlines may change according to the current fashion, or the bias of the research, the basic goals and objectives of businesses haven't changed that much. We'd go so far as to say that they haven't changed that much for hundreds, if not thousands, of years.

Almost every business in the world has the same objectives at its heart. Whatever the geography, or industry sector every organisation wants to:

- **Do what it's doing, better**

  All businesses want to be able to improve the way they operate.

- **Take cost out of the business**

  We have not met a COO or CFO who doesn't have this as a key priority. No business wants to spend more than necessary.

- **Respond more quickly to changes in the commercial environment**

  The most successful businesses don't focus exclusively on cost, however. Leading organisations know when to invest in order to respond to new challenges. Whether those changes are brought about by the entry of new competitors to the market, or by rules imposed by regulators, the phrase "adapt or die" was never truer than it is today.

What does this mean for the CIO?

When it comes to CIOs, again all of the research is remarkably consistent. CIOs have a set of very stable goals, more or less every CIO wants to:

- **Lower the cost of IT**

  While there are some areas of IT cost that are seen as commercial investment, much of IT infrastructure is still regarded as a cost.

- **Reduce operational risk and uncertainty**

  IT failures are still common, and as our infrastructure has become more complex the task of making it resilient against failure becomes increasingly difficult to complete.

- **Become more responsive**

  This mandate speaks to one of the most common complaints that we hear about IT from business leaders – IT takes too long to get things done. The ability to define and deploy new business processes, and the infrastructure that supports them, is a significant factor in dividing the winners from the losers.

- **Prepare for the future**

  When looking at potential investments, CIOs have to satisfy themselves that they are not making an investment decision that is going to lead them down a technology cul-de-sac.

This release of CICS is focussed on the CIO's key priorities

The reason we believe that this release of CICS is so significant, is that it delivers benefits which will help CIOs to deliver on each of the core priorities that we've outlined, and signals a clear intention by IBM to take the best features and services provided by cloud computing and incorporate them into CICS.

Lowering the cost of IT and becoming more responsive

In terms of the core platform, CICS 5.1 makes it possible to consolidate many regions into one. This brings immediate benefits in terms of administration workload, licensing and resource utilisation. In internal tests IBM was able to consolidate 30 regions into 10, resulting in a 10% reduction in overall utilisation. Looking beyond this at the cloud enablement features, the ability to define platforms, applications and policies makes it possible to deploy and manage new functionality more easily (and at lower cost) and to make better use of the available resources.

In addition to improvements in the economics for traditional workloads, improved support for Java has resulted in a performance improvement of over a third. The fact that you can now run a Java servlet/JSP container within the CICS environment means that you can now locate Java web applications within the same logical environment as the CICS transactions that they invoke – this delivers a significant improvement in throughput and allows the web applications to benefit from the same quality of service as the transactions they consume.

Reducing overall risk and uncertainty

We estimate that more than half of all major system outages are a result of some failure in configuration or management. This should not be surprising, given the complexity of some systems, and we'd argue strongly that many distributed computing environments present a far greater configuration and management challenge than the CICS environment.

IBM has made the task of managing the CICS environment easier in three key ways. Firstly, by enabling groups of regions to be managed as a logical unit IBM is reducing the amount of duplicated configuration and administration effort. Secondly, by providing tools that offer a simpler way of managing the (sometimes rather esoteric) configuration settings that CICS requires, IBM has made the process of configuring CICS a lot less onerous. Finally, the introduction of a policy management system, means that it is now possible to predictably and reliably manage entire applications without having to rely upon the services of an expert systems administrator.

Preparing for the future

This is perhaps the most difficult thing for a CIO to do, and no-one can hope to be able to predict the future accurately enough to be completely prepared. So when looking at a given solution the CIO has to first establish what elements of the current technology provide a degree of future proofing. Here IBM can point to the strong support that CICS has for integration with web-based applications as well as its inbuilt support for new workloads like Java. The next step is come to some idea of how likely it is that the solution being looked at will evolve as time passes. CICS has a very well-established record in this regard, since adding support for TCPIP in the 1990s, IBM has added support for Java (and other languages including PHP), web services, and other internet protocols, in addition to iteratively overhauling all of the management and configuration tooling over the past five years. Finally, the CIO needs to be satisfied that the vendor will continue to invest in developing the technology. Given the importance of the CICS installed base to IBM, combined with the fact that this release comes six months earlier than the usual cycle (traditionally major releases of CICS were every 24 months, this time it was 18) it is hard to doubt IBM's long-term commitment to CICS.

CICS 5.1 announcement detail

IBM has grouped the key technical elements of the new release under two logical headings: operational efficiency, and service agility. We would also call out the improvements that IBM has made to the CICS tooling portfolio as the supporting admin, management and monitoring tools all play a key role in supporting the enhancements that have been made to the platform.

This section will describe the most significant technical enhancements, but for a full list you should refer to IBM's announcement.

Operational efficiency

These enhancements have a direct impact on the overall cost of running the environment, and given the emphasis that most organisations continue to place on driving improvements in efficiency they're key to the ability of IBM to continue to make the business case for CICS. Operational costs are made up of a number of factors: the cost of the hardware, administration costs, and the costs associated with bringing new applications online.

The net result of these enhancements is as follows;

- **The ability to reduce admin burden and deliver a saving in processor utilisation by consolidating regions**

  IBM has improved the overall capacity and scalability of the platform, allowing more tasks to be run in each region. This makes it possible to consolidate multiple regions into one, lowering admin costs, and making more effective use of processing capacity. This release also improves horizontal scalability, reducing the overheads associated with making calls across regions and machines.

- **Improved Java performance**

  IBM has added new instructions specifically for Java, which improves performance significantly. IBM has seen an improvement of close to 45% on the Java multi-threaded benchmark, for example. This release includes an embedded Servlet/JSP runtime, allowing servlets to run within the same environment as COBOL transactions. This brings about a significant improvement in performance where servlets are calling functionality provided by existing CICS transactions.

- **Improved operational control**

  CICS now provides support for policy based management and administration. This means you can set specific policies (that may include alerts, events, or task cancellation) that apply when certain thresholds are breached. This gives you the ability to control resource consumption, you can set thresholds for CPU, storage, database access etc. and then trigger an event or a specific action, for example sending a message or shutting down a task (by triggering an event).

- **Improved data access**

  Assembler programs can now directly access 64 bit storage, which means that much greater volumes of data can be managed within a region, which significantly reduces the overhead associated with processing massive volumes of data.

- **Reducing the need for planned downtime**

  It is now possible to perform an upgrade to the CICS environment itself without having to restart the host operating system. In addition, where it used to be necessary to restart CICS in order to perform a refresh of the SSL environment, this can now be done at runtime.

- **Policy based management lowers admin cost and improves reliability**

  Sets of CICS transactions (along with the other resources that are associated with them) can now be placed into bundles, which can then be managed as a logical unit.

Service agility

This component of the announcement addresses agility, the ability to respond rapidly to changes in demand, and deploying new applications more quickly. IBM has taken some of the ideas that underlie cloud computing and applied them to CICS.

Introducing applications and platforms

IBM has introduced two new concepts, the application and the platform. Applications are a collection of one or more CICS bundles which can then be managed as a single entity. Platforms allow one or more CICS regions to be associated with a set of policies, which are automatically applied to any application that is deployed to it.

Applications

Applications represent a grouping of all of the different resources that are required for a given application to be deployed and managed as a single entity.

The dependencies between the different resources that make up an application are managed and tracked throughout the application lifecycle, which means that the process of transitioning from development, to test, and then to production is much simpler to achieve, and much less prone to error.

Applications are controlled by a set of policies, which can be modified at run-time, and resource utilisation can be measured on a per-application basis, so billing and charge back is simplified.

Platforms

A platform is a grouping of CICS regions which are treated as a single logical cloud of resources.

By de-coupling applications from the underlying CICS region infrastructure, the provisioning and de-provisioning of resources can be automated – so regions can be added (or removed) at runtime and the application can automatically make use of the resources that are made available to it.

As with applications, platforms can be managed dynamically by modifying and applying policies at run-time.

Improved management, monitoring and administration tools

One of the most common preconceptions of the CICS environment is that it requires an army of "Jedi" systems administrators to manage it. While it is still true that very large scale CICS deployments do need professional systems administrators, IBM has been working for several years to produce tooling that makes the process of managing CICS far easier. IBM has a clear strategy to improve the ease of use of its key management and configuration tools, and with the release of CICS 5.1, new versions of a number of the key tools have also been released including the CICS Deployment Assistant, CICS Interdependency Analyzer, CICS Performance Analyzer, CICS VSAM Recovery Manager, and CICS Configuration Manager.

IBM's goal with this suite of tools has been to provide as much automation as possible, while still allowing an expert system administrator to do their own fine tuning. Many of the tasks now have wizard-like interfaces that can guide a user through a process, while still allowing someone more experienced to look directly at the commands that the tool will execute. This means that many tasks that would, in the past, have required the services of a highly skilled administrator can now be performed by someone with relatively little expertise in the platform.

Conclusion

CICS 5.1 represents a major evolution of the CICS platform. It delivers improvements in the economics, usability, agility and performance of the platform and represents proof of IBM's on-going commitment to the platform.

For us, IBM's emphasis on cloud enablement represents a lot more than window dressing, it demonstrates that IBM has taken a careful look at the benefits that cloud computing offers and taken some important initial steps towards embedding them within CICS.

CICS is not an alternative to public cloud, nor should it set out to be. CICS offers a highly reliable, extremely high-performance environment for the most demanding workloads. That said, by taking the best bits from the world of cloud computing IBM is bolstering the relevance of, and the business case for, CICS and z/OS.

About Bathwick Group

Bathwick Group has three divisions: research and consulting, powerful survey and marketing software, and a strategic think tank.

Bathwick: Research and consulting

Research and consulting in four core practice areas:

- ***IT industry*** Customer analysis and unique marketing programmes for vendors targeting mid-market and enterprise markets; strategic planning and go-to-market execution support
- ***Enterprise IT*** Strategic support for enterprise IT leaders; productivity and infrastructure agility benchmarking and best practice
- ***Sustainability*** Benchmarking and planning support for organisations wishing to embed sustainable practices and mitigate strategic risks. Future threat and opportunity identification
- ***Innovation*** Rapid collaborative engagement services combining your key people with external experts to expedite solutions to major corporate challenges. IP protection frameworks

STORRM Software

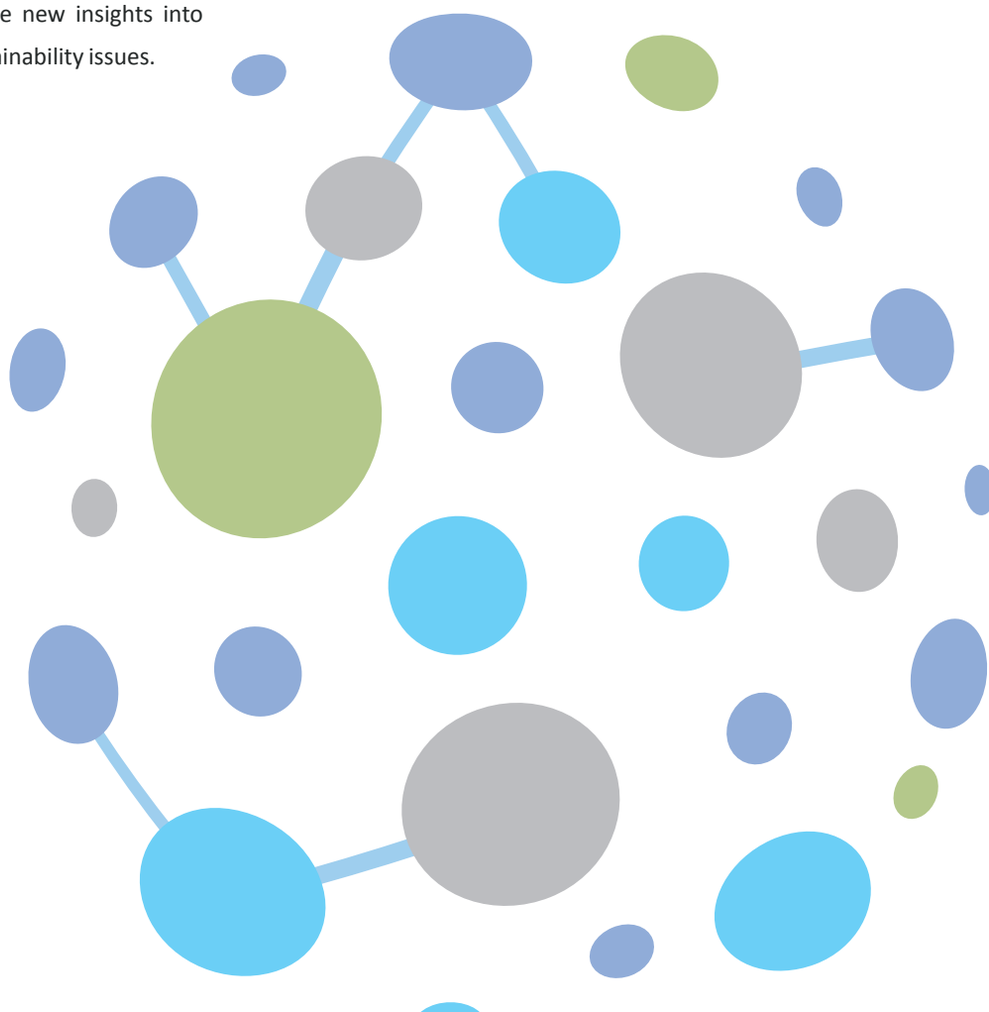
An enterprise-wide data collation, analysis and distribution platform

A flexible multi-language software platform for surveys, benchmarks and assessments, market intelligence, lead generation and nurturing, sales enablement, marketing collateral distribution and control, offline surveys, games and multiple intelligence applications.

ThinkAgain

A global collaborative research network

ThinkAgain brings together business and political leaders with investors, academics, and leading thinkers to generate new insights into business performance, geo-political and sustainability issues. Membership is by invitation only.



Document number: BG-ITS-W-00107UK-EN-00