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CICS TS and the Cloud

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Session 10281

Agenda

- A (very) Brief History of Computing
- The Anatomy of a Cloud
- What can you do with CICS in a cloud style?

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In the beginning….

…was the mainframe

- The IBM S/360
- IBM created the first fully *virtualized* hardware machine in 1967
- and made it a standard feature of all the S/370 mainframes in 1972

Many Virtual Machines able to run on a single mainframe, sharing the CPUs, memory, storage and network

Users accessed the VMs from *thin clients* (“dumb terminals”)

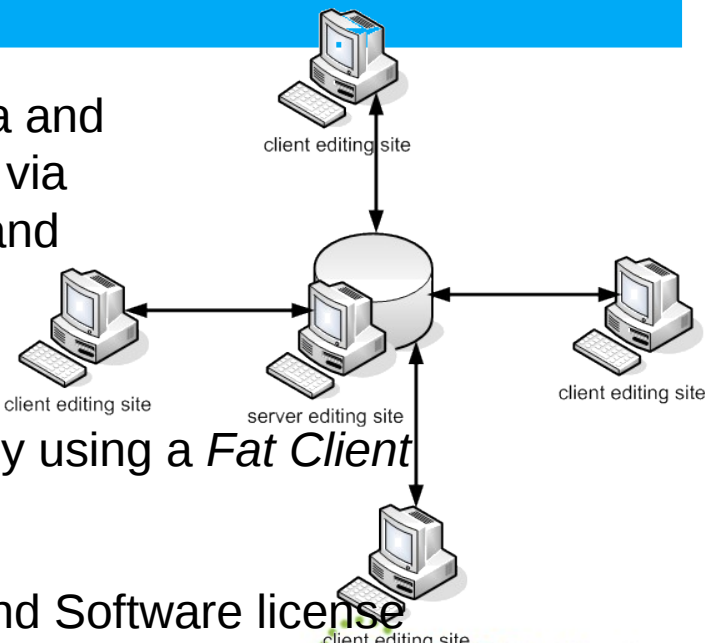
The usage of the mainframe was broken down in detail to allow charge-back to the users’ departments

and then things got distributed…

- The ’80’s saw the shift to Personal Computing…
  - Democratization of computing, making it cheaper for more people to have access to computers
  - Initially a shift to “computers for all”, with each user having the whole machine dedicated just to them

Optimized for Agility

- … the 90’s to Client-Server computing
  - Sharing data and applications via Client PCs and Server PCs
  - User typically using a *Fat Client*
  - Hardware and Software license costs per machine



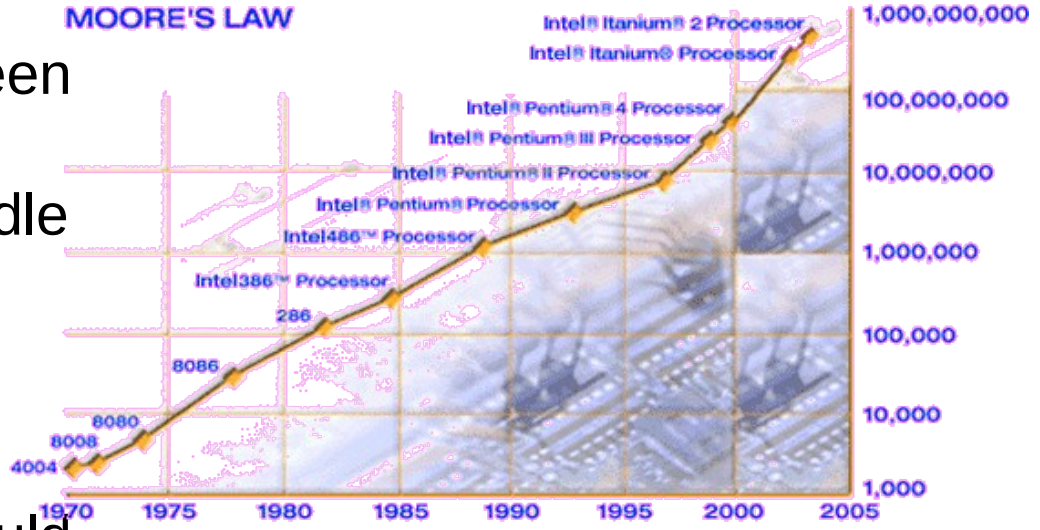
…and the web took this to the extreme

- The turn of the millennium saw further democratization of computing…
  - Now a shift to “sharing for all” and “content for all”
  - But also a shift back to *thin clients* (the web browser) to access the applications as services
    - …and emergence of standards to re-connect the distribution
      - to try and help to join back up all the distributed computers
      - Grids, Web Services, and Utility Computing have visions of “Virtual Organizations”

Optimized for Scale

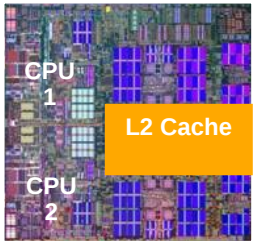
Meanwhile…the hardware “free lunch” runs out

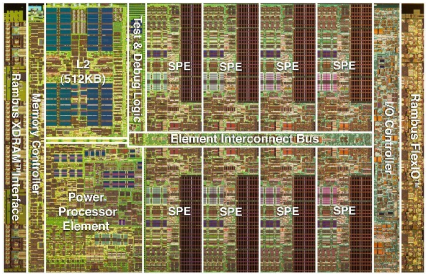
- Whilst processors had been getting faster and faster, individual PCs could handle the increasing workloads



- But although transistors continue to shrink, we could no longer make them run faster and faster*

- The solution was to *scale out* (with multi-cores and commodity hardware) rather than *scale up*



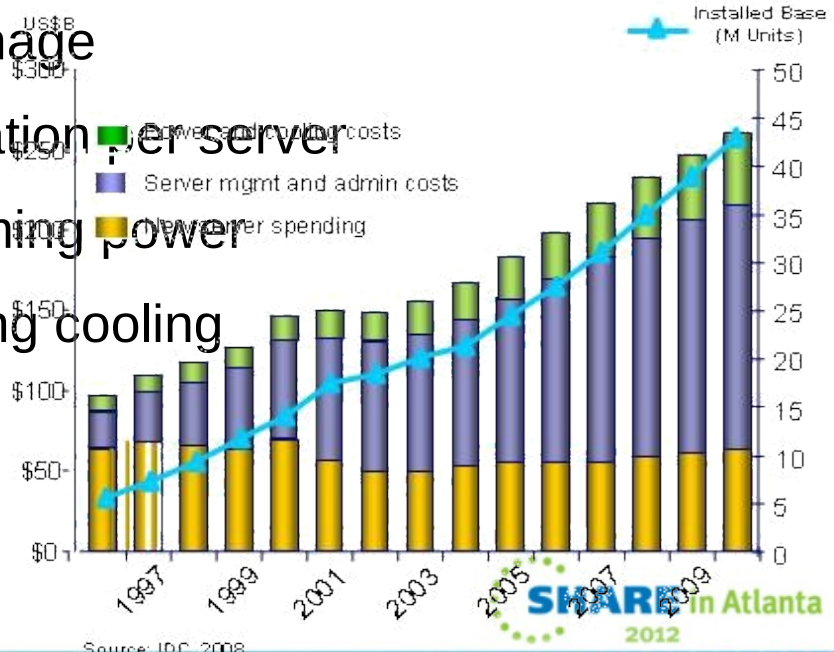


But what was wrong with this picture?

- The key values from the mainframe platform were lost
  - The management capabilities of a single platform
  - The high utilization
  - The redistribution of costs of the platform to its users

Server machines bought and installed for specific applications

- Many different operating systems, software and middleware to manage
- Very low utilization per server
- All consuming power
- All needing cooling



Source: IDC, 2008

With the economic climate, and ecological issues, things had to change…

Doing more with less

Reduce capital expenditures and operational expenses

Reducing risk

Ensure the right levels of security and resiliency across all business data and processes

Higher quality services

Improve quality of services and deliver new services that help the business grow and reduce costs

Breakthrough agility

Increase ability to quickly deliver new services to capitalize on opportunities while containing costs and managing risk

"A mainframe *is* a cloud,"

"The mainframe is very well controlled in most organizations, often to the point where it's locked in a room and people can't access it,"

"If they are not automating things, if they don't have a self-service portal, then it's not a cloud architecture, it's just a virtualized environment,"

Under the old system, "the developer had to request operations to set this up and it would take weeks or months. Now in a matter of 15 minutes, he can do it himself,"

“New job for mainframes: Cloud platform”, Computerworld

> **[The mainframe] platform has scalability and partitioning built in at its core.**

Judith Hurwitz, President And CEO, Hurwitz & Associates

> **[Mainframe vendors] are going to have to do some developing to allow the self-service features of the cloud.**

Julie Craig, Analyst, Enterprise Management Associates

> **There is incongruity between what's out there in cloud today and what these big mainframes do.**

Phil Murphy, Analyst, Forrester Research

"New job for mainframes: Cloud platform", Computerworld

The NIST Definition of Cloud Computing

Cloud computing is a model for enabling ***convenient, on-demand*** *network access to a* ***shared pool*** *of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be* ***rapidly provisioned and released with minimal management effort or service provider interaction****. This cloud model promotes* ***availability*** *and is composed of five essential* ***characteristics****, three* ***service models****, and four* ***deployment models****.*

Essential Characteristics

- On-demand Self Service
  - *A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically **without requiring human interaction** with each service's provider.*
- Broad Network Access
  - *Capabilities are available over the network and accessed **through standard mechanisms** that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, laptops, and PDAs).*
- Resource Pooling
  - *The provider's computing resources are pooled to serve multiple consumers using a **multi-tenant model**, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. …*
- Rapid Elasticity
  - *Capabilities can be **rapidly and elastically provisioned**, in some cases automatically, to quickly scale out and **rapidly released** to quickly scale in. …*
- Measured Service
  - *Cloud systems automatically control and optimize resource use by leveraging a metering capability at **some level of abstraction appropriate to the type of service** (e.g., storage, processing, bandwidth, and active user accounts). …*

The NIST Definition of Cloud Computing Special Publication 800-145

Service Models

- *Cloud Software as a Service (SaaS).* The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. …
- ***Cloud Platform as a Service (PaaS)*. The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider. …**
- *Cloud Infrastructure as a Service (IaaS).* The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. …

The NIST Definition of Cloud Computing Special Publication 800-145

Service Models

- Software as a Service (SaaS).

The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through either a thin client interface, such as a web browser (e.g., web-based email), or a program interface. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited userspecific application configuration settings.

The NIST Definition of Cloud Computing Special Publication 800-145

Service Models

- Platform as a Service (PaaS).

  The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.

The NIST Definition of Cloud Computing Special Publication 800-145

Service Models

- Infrastructure as a Service (IaaS).

  The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls).

The NIST Definition of Cloud Computing Special Publication 800-145

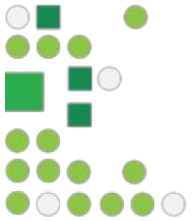
Cloud computing is an Evolution that helps deliver IT and business benefits

Virtualized

Higher utilization
Economy of scale benefits
Lower capital expense

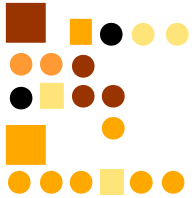
Standardized

Easier access
Flexible pricing
Reuse and share
Easier to integrate



Automated

Faster cycle times
Lower operating expense
Optimized utilization
Improved compliance
Optimized security
End user experience

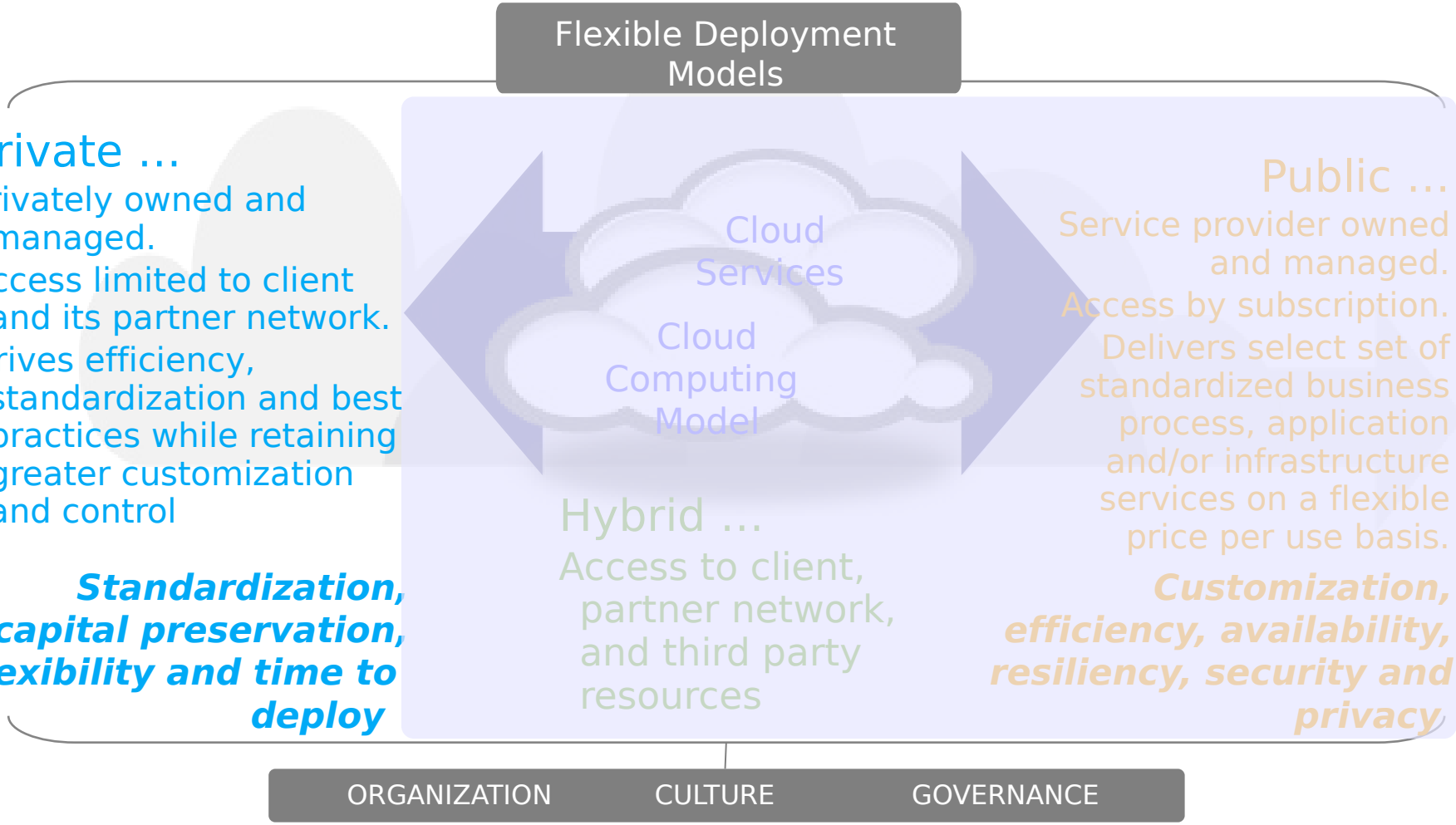


Doing more with less

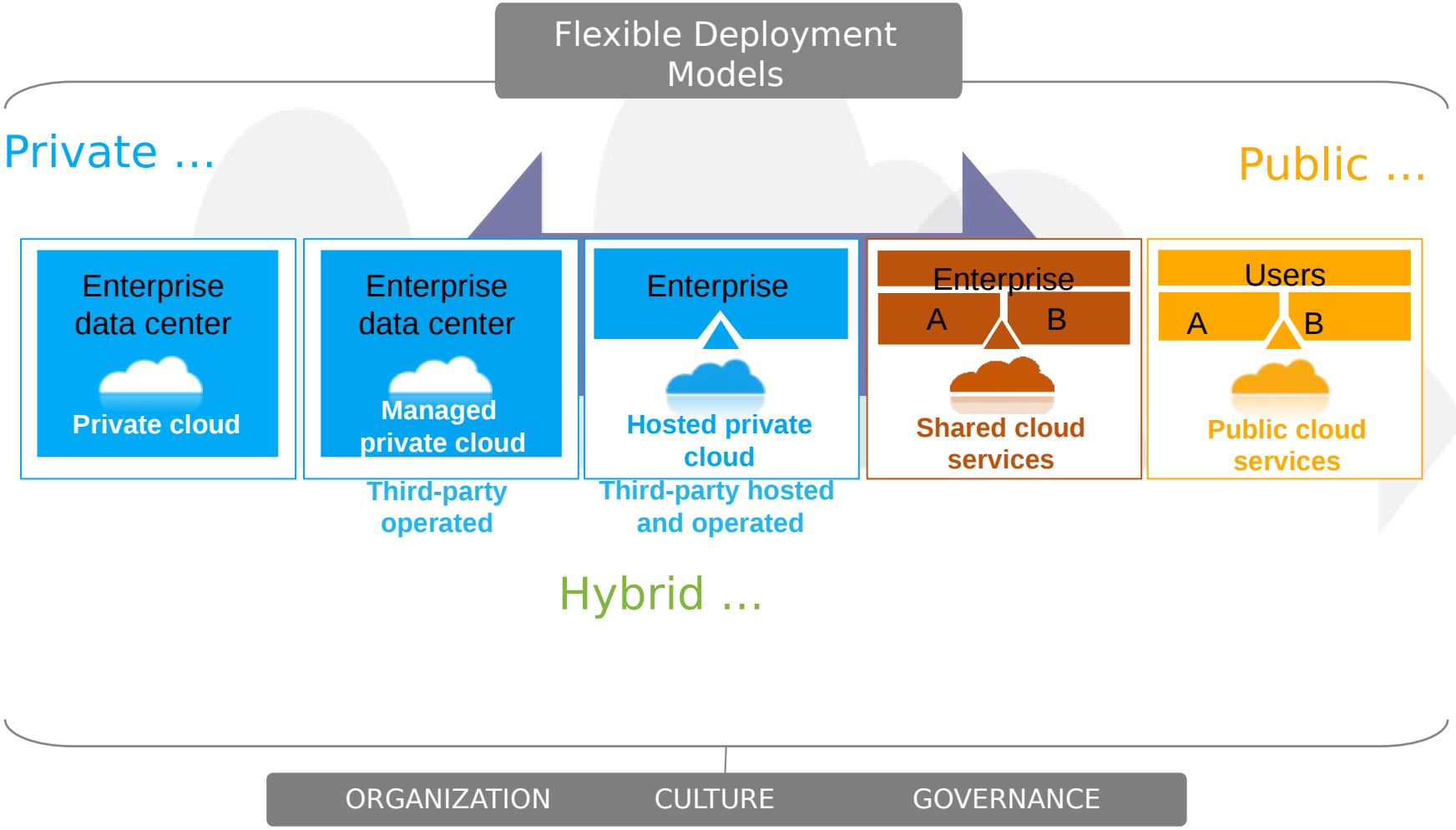
Higher quality services

Breakthrough agility and reducing risk

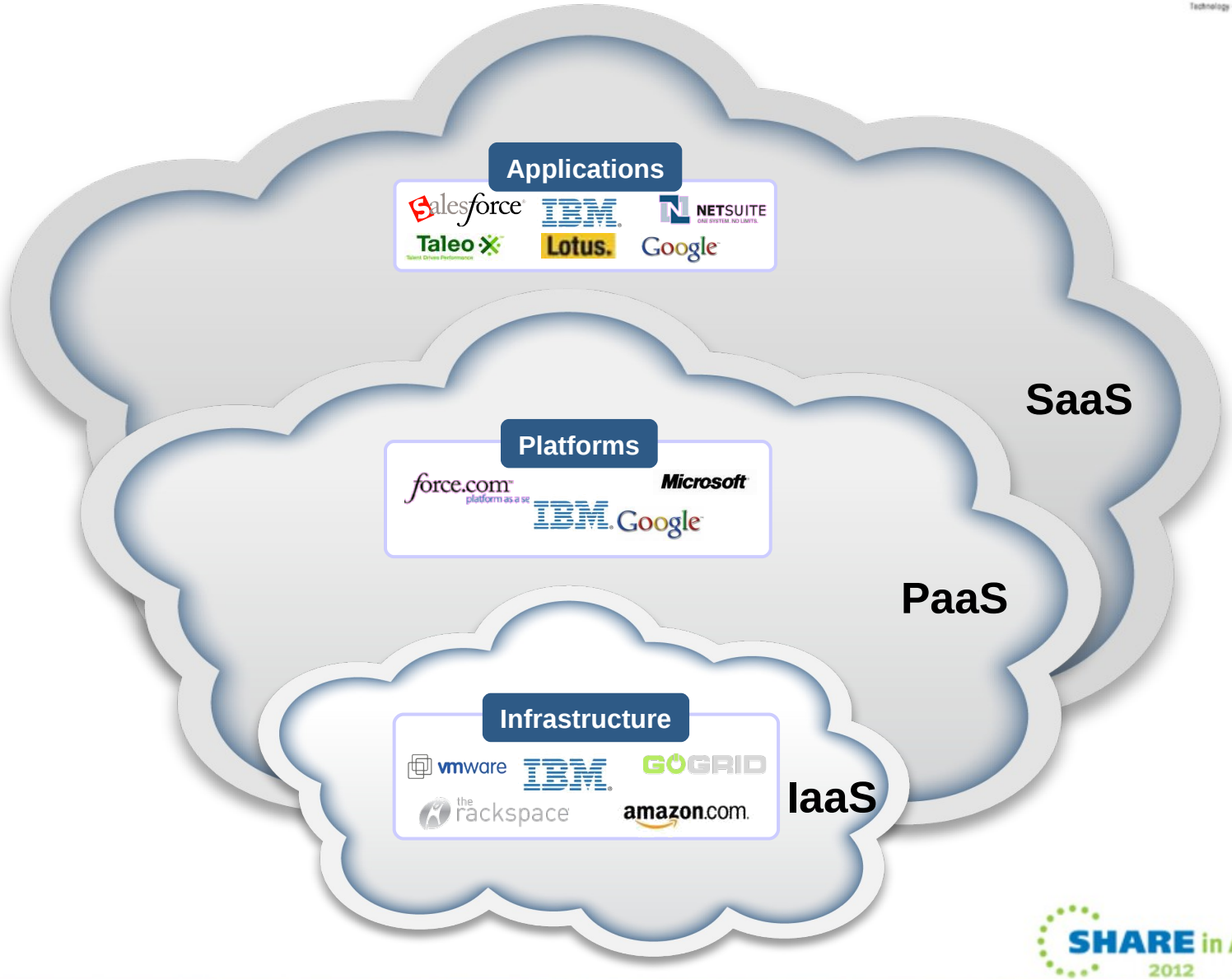
Cloud Computing Deployment Models



Cloud Computing Deployment Models



There are a range of layers to clouds



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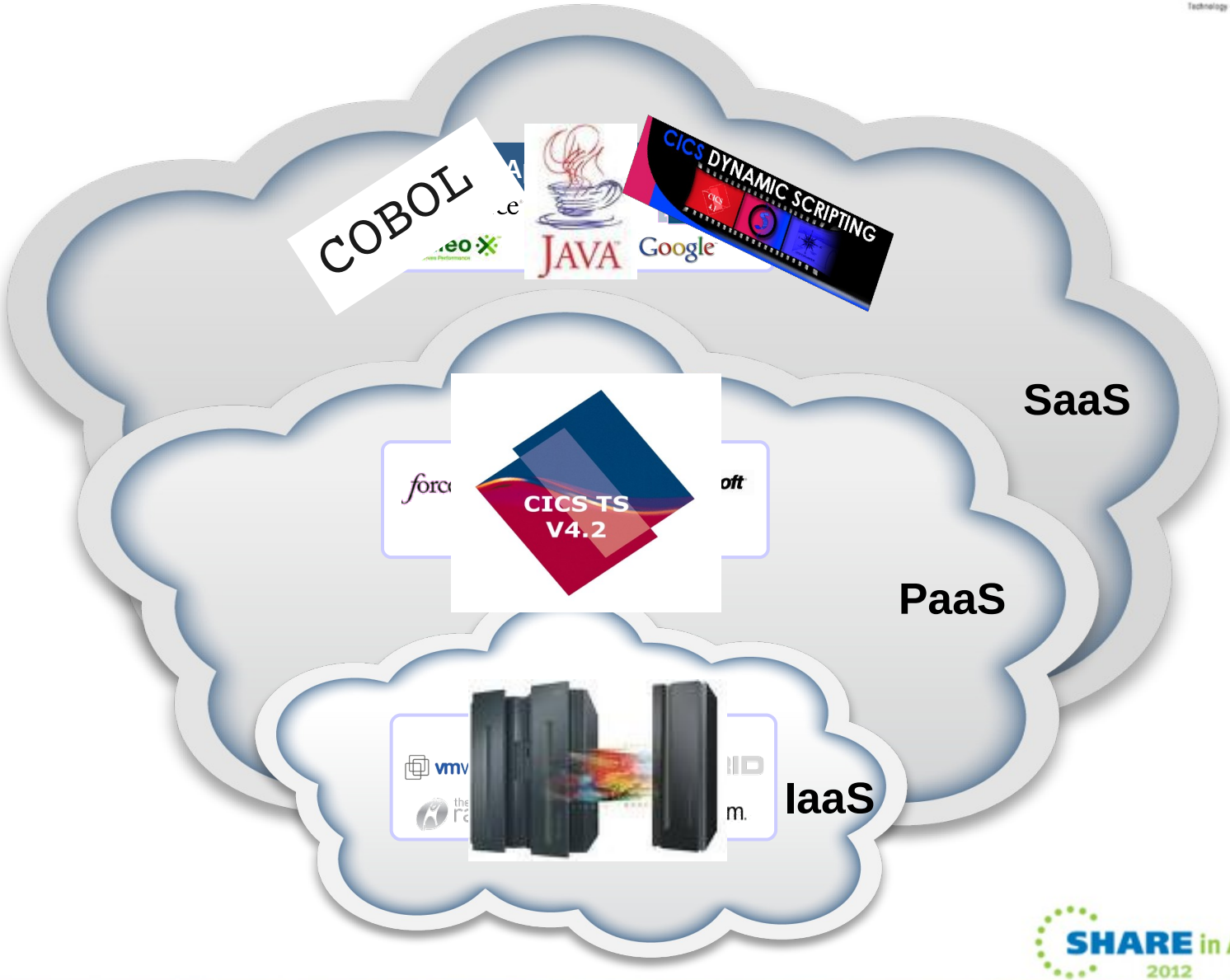
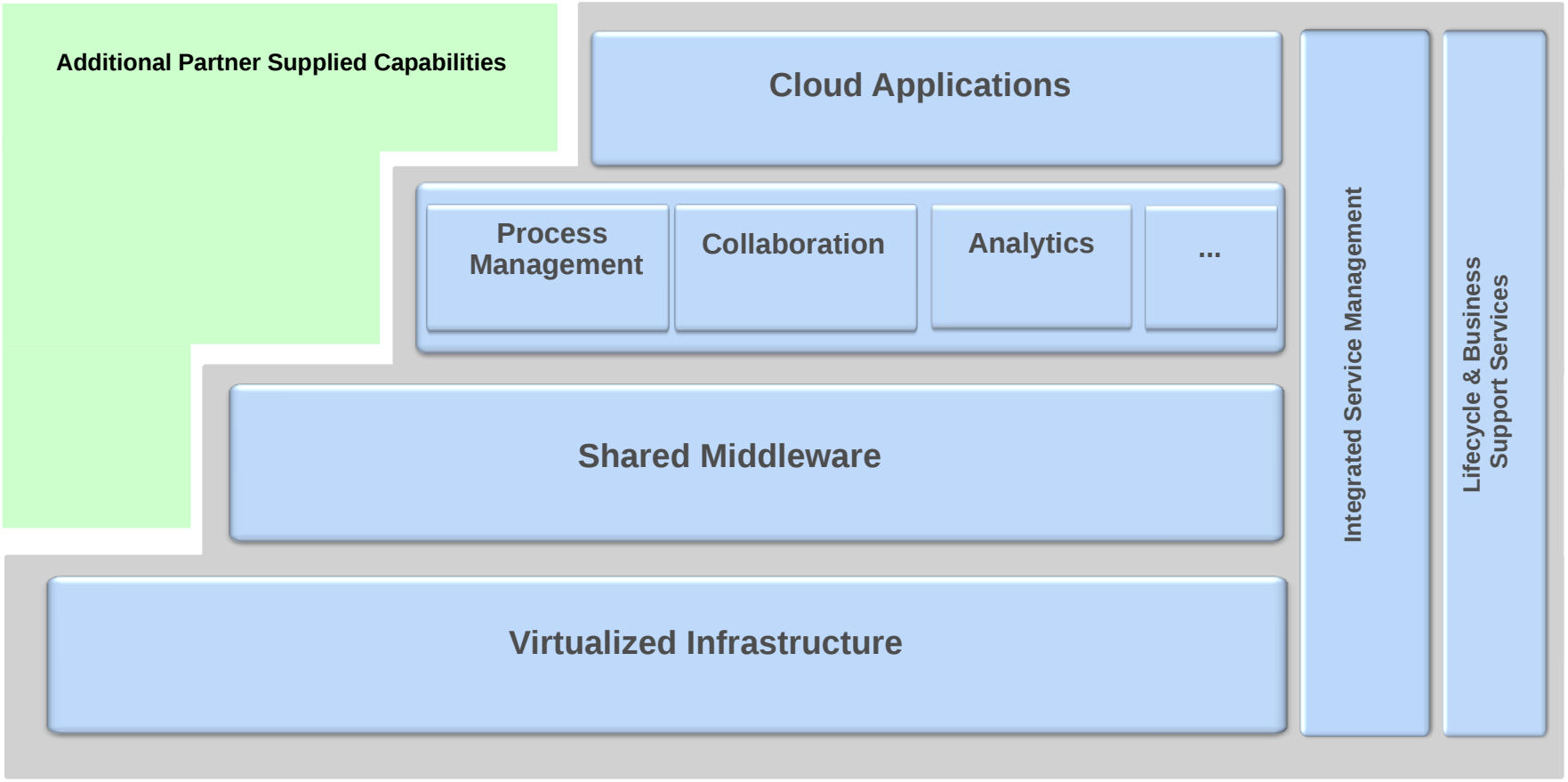
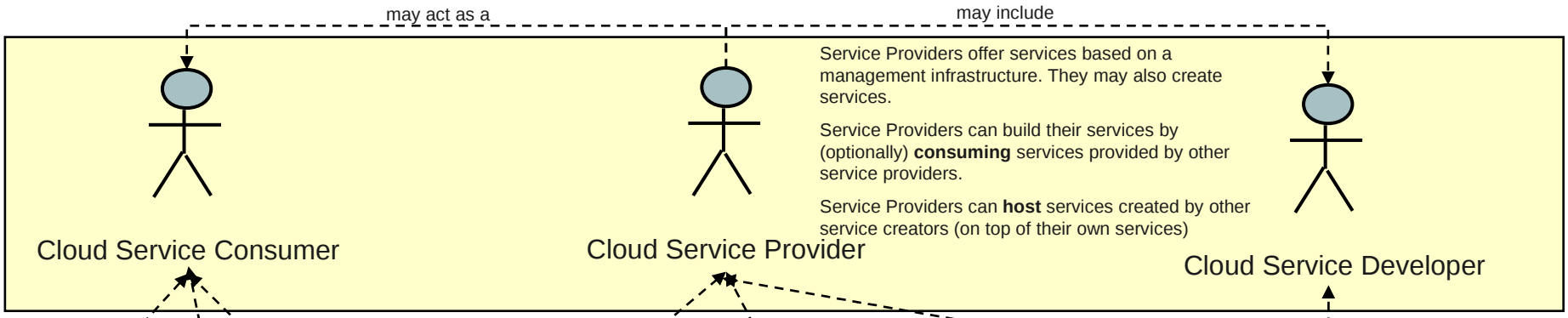


An IBM architectural view of cloud computing



Common Role definitions



Consumer Business Manager

- Business / financial responsibility for consumed services
- Accounted for used services instances

Service User

- Uses service instances provided by service provider.

Service Consumer Administrator

- Requests service instances and changes of service instances (typically on behalf of Consumer Business Manager)
- Provides access to services for service users

Service Operations Manager

- Manages technical infrastructure required for providing cloud services

Service Business Manager

- Offers all types of services (SPI) created by service creator
- Accounts services consumers for services potentially offered by service provider themselves and services offered on behalf of service creator

Service Transition Manager

- Responsible for enabling a customer to use the cloud service, incl. boarding, integration, and process adoption

Designs, implements, and maintains service templates (technical aspect)

Multi–tenancy in Cloud environments

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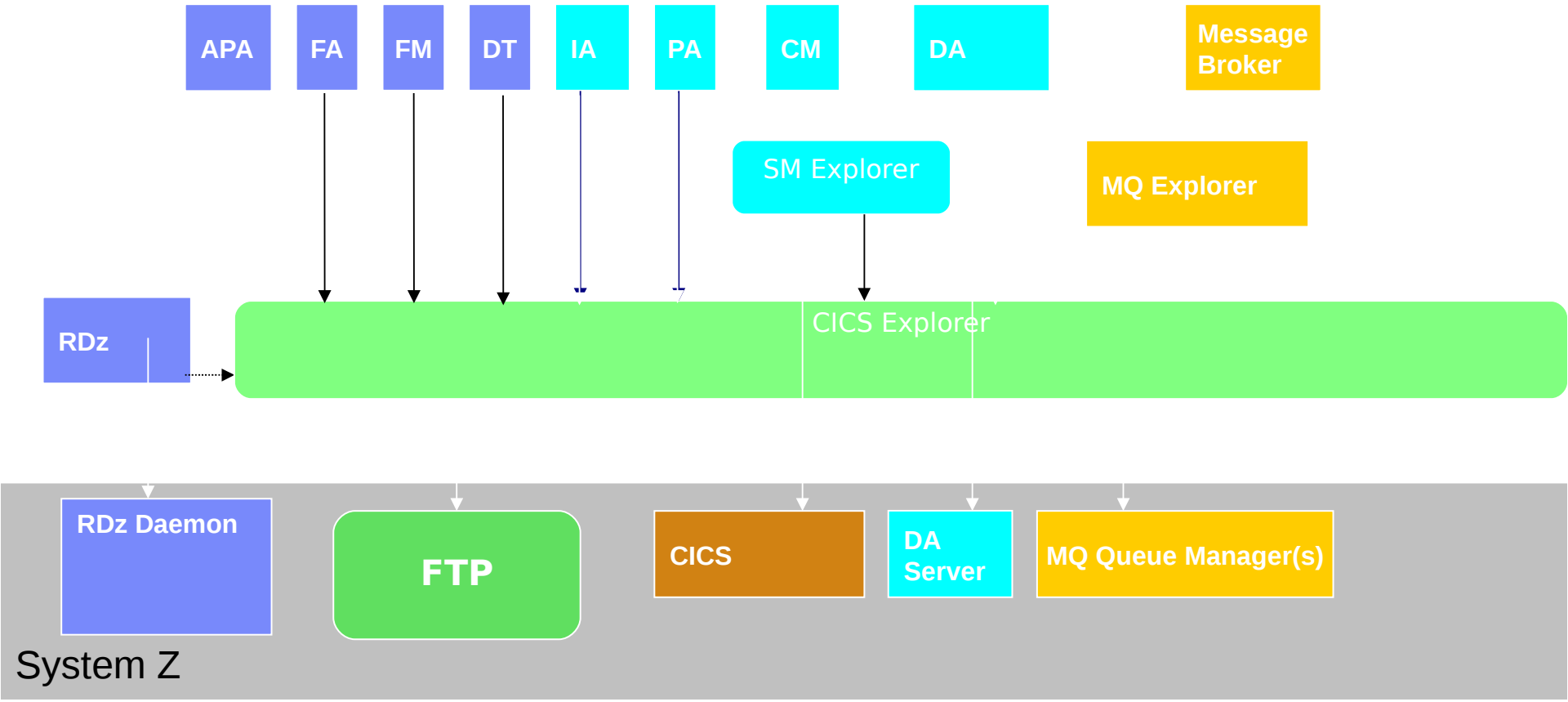
CICS Explorer
And
Deployment Assistant

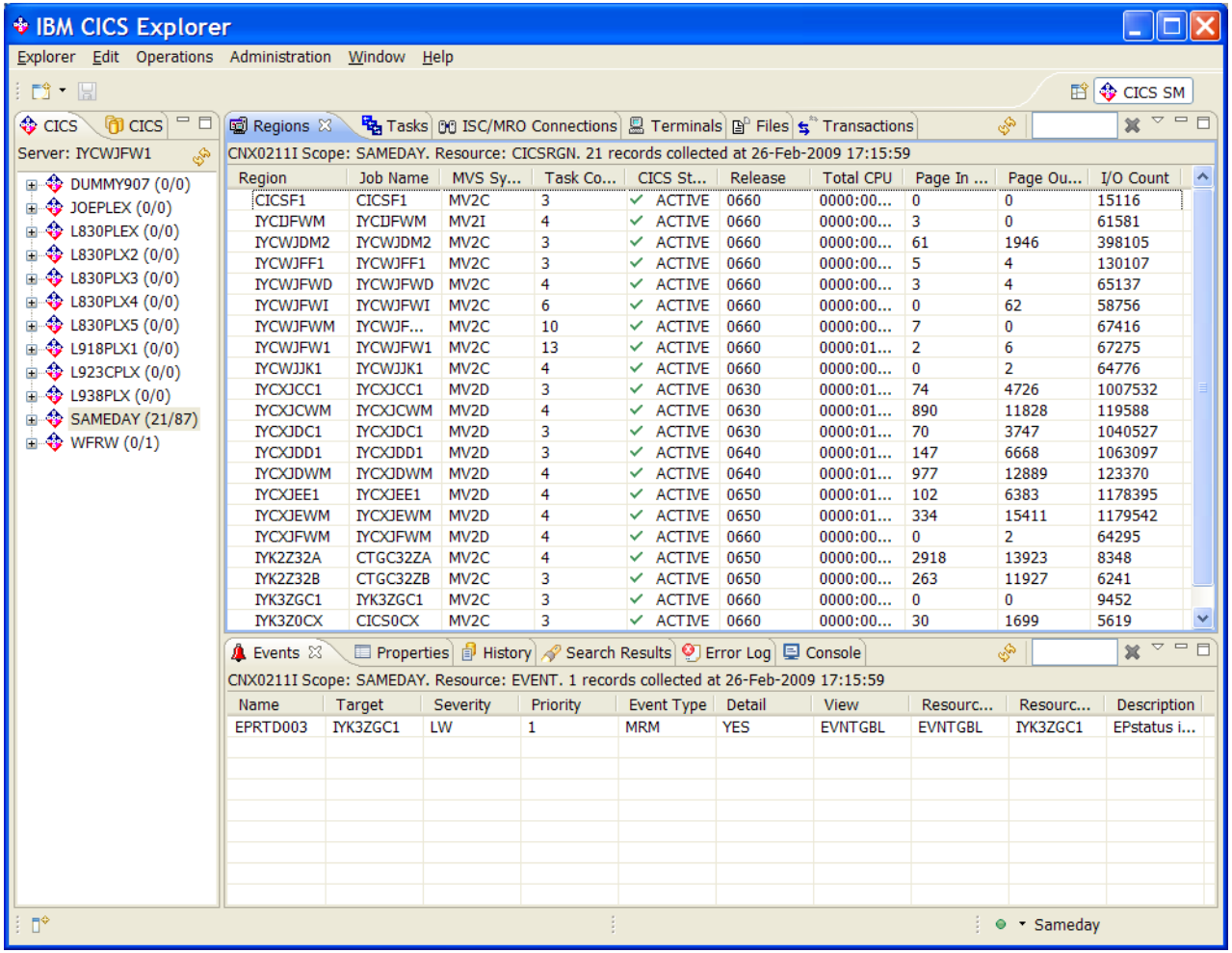
Why CICS Explorer ?

- *Simplify CICS*
  - ***New users, familiar user interface, high learning curve, grey hair investment***
- *Integration platform*
  - ***Value of the sum exceeds the part, first class cross tool scenario integration.***
- *Wide and deep*
  - ***Streamline process and add value to experienced CICS professionals***

Explorer Landscape



The Look: CICS Explorer



CICS Explorer V1.0.1 system Z support

- CICS Explorer base component
  - Integrates into CICS Explorer SDK
  - Access via FTP to:
    - *Datasets*
    - *USS File System*
    - *Spool*
- Usually zero-config for the ‘host component’
  - It’s FTP!
    - *So probably already running!*
    - *Secure FTP supported*
    - *Bad news however if client cannot reach host using FTP…*

CICS Deployment Assistant v1.1 – Functions I

- Discover Running CICS
  - Capture to a ‘model’
- Display model
  - System Topology details
- Exploitation of CICS Explorer V1.0.1 system z support:
  - Data set/USS File system, completed spool
- Active Spool support
  - Look at your running CICS joblog
  - View SYSLOG
  - Enter MVS commands

CICS Deployment Assistant v1.1 – Functions II

- Specify Start Policy
  - Started task/job or Batch
  - Start a CICS based on pre-defined policy within CICS Explorer
  - Stop CICS
- Clone an existing CICS
  - Typically AOR/TOR
  - Some plumbing included
- SIT option display
  - SYSPARM resource for CICS TS V4
  - Subset of function for CICS TS V3
- Linkage between SM and DA perspectives
- Cheat-sheets
  - CICSPlex SM Setup
  - Upgrading CICS TS

- Program Number: 5655-W48
- S&S PID: 5655-W62
- FMID: HGEM110
- GA date: 24 September 2010
- Product prefix: CPH

- Client download:
  http://www.ibm.com/cics/explorer/download
- Client prereqs:
  - Same as CICS Explorer V1.0.1:
    - *x86 platform*
    - *32-bit*
    - *Windows XP, Vista, 7, Server 2003, Server 2008*
    - *Linux (Red Hat 5, SUSE Linux Enterprise Server 10)*

Explorer 1.0.1 / CICS DA Function Comparison:

Function	*CICS Explorer V1.0.1*	*CICS DA V1.1.0*
Edit z/OS Dataset sequential and Partitioned	✓	✓
Edit z/FS file	✓	✓
Create new member	✓	✓
Display 'jobs'	✓	✓
Select 'job' queue (Input/Output/Active)	✓	✓
Display completed spool	✓	✓*
Display active spool	✗	✓
Display system log	✗	✓
Display CICS Version 4 SIT options †	✓	✓
Display CICS Version 3 SIT overrides	✗	✓

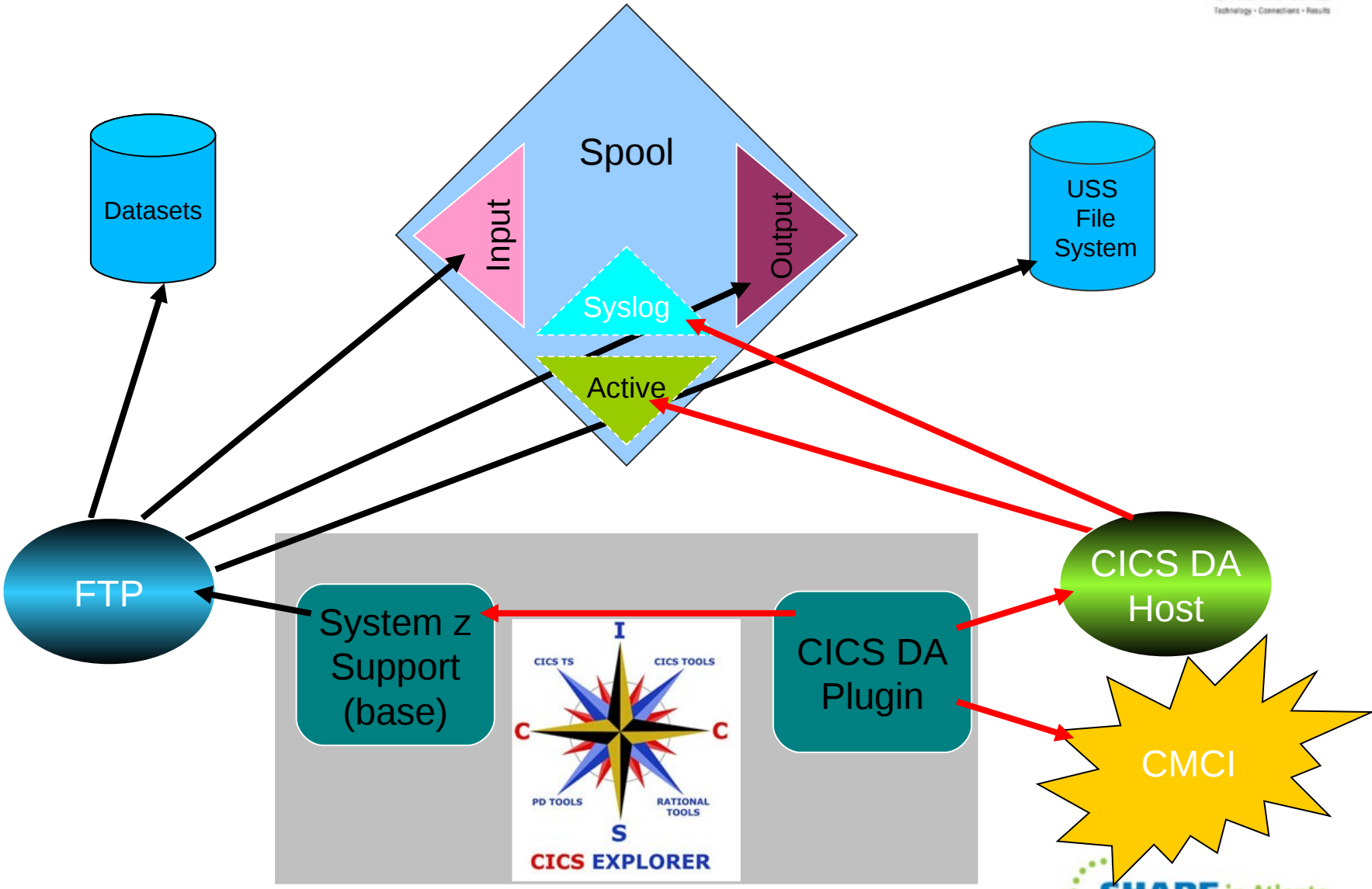
† - Requires UK60398 and UK60399

* - Faster with CICS DA

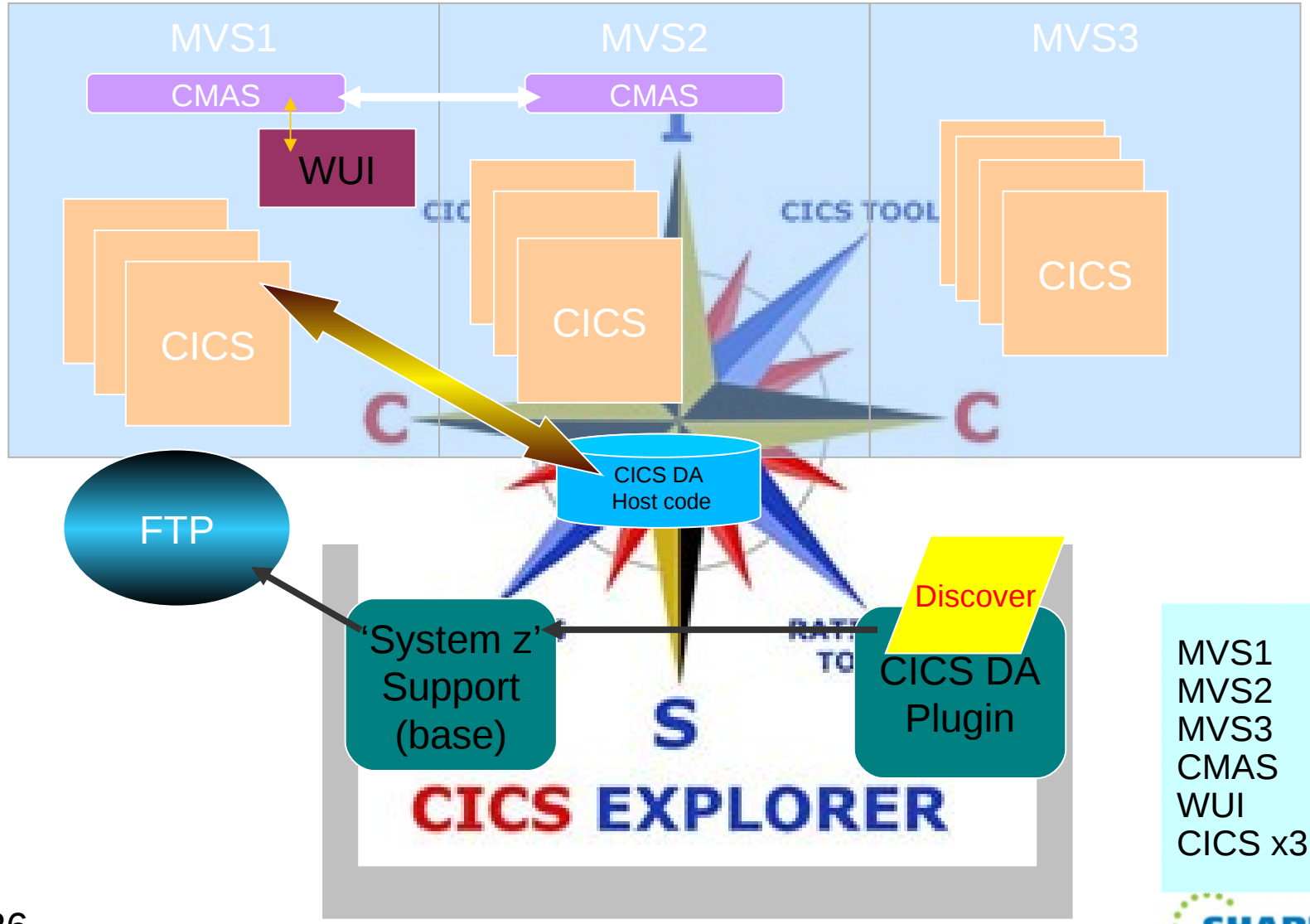
CICS DA 1.1 Prereqs

- CICS TS V3.1 or higher
  - Experience will be better with later versions of CICS TS
- z/OS 1.9 or higher
  - JES3 Users will need z/OS 1.10
  - Syslog support requires z/OS 1.11
  - JESplex auto detection requires z/OS 1.11
- For SIT support on V4:
  - CICS TS V4 Users need PTFs for APARs PM15214 and PM15583
- CICSPlex SM
  - If systems to be managed not part of a CICSPlex SM managed CICSplex use DA cheat sheet to help set it up

CICS DA Architecture: Access to z/OS

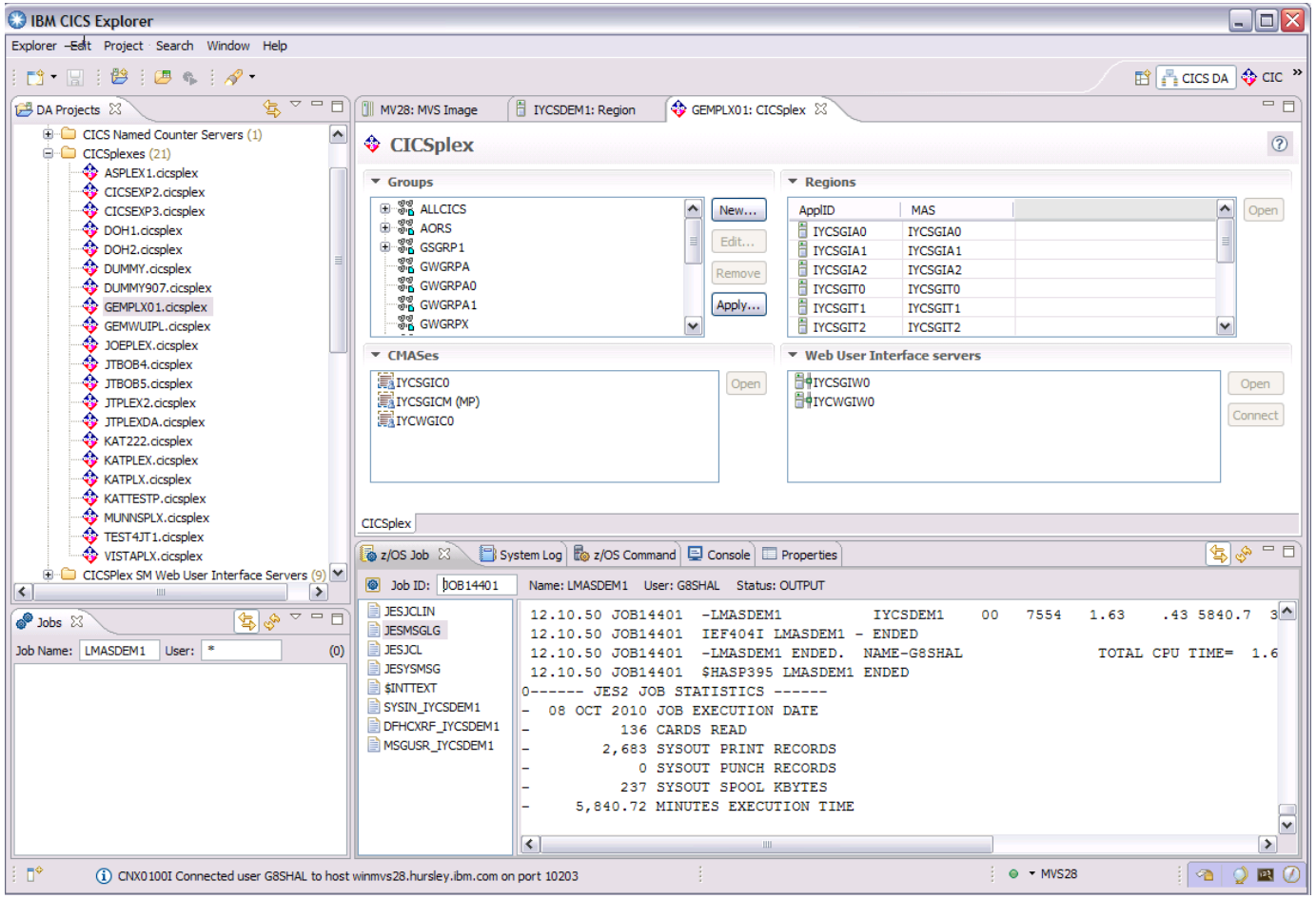


CICS DA Architecture: Discovery



MVS1 ⩾
MVS2
MVS3
CMAS ⩾
WUI ⩾
CICS x3 ⩾

What you experience...



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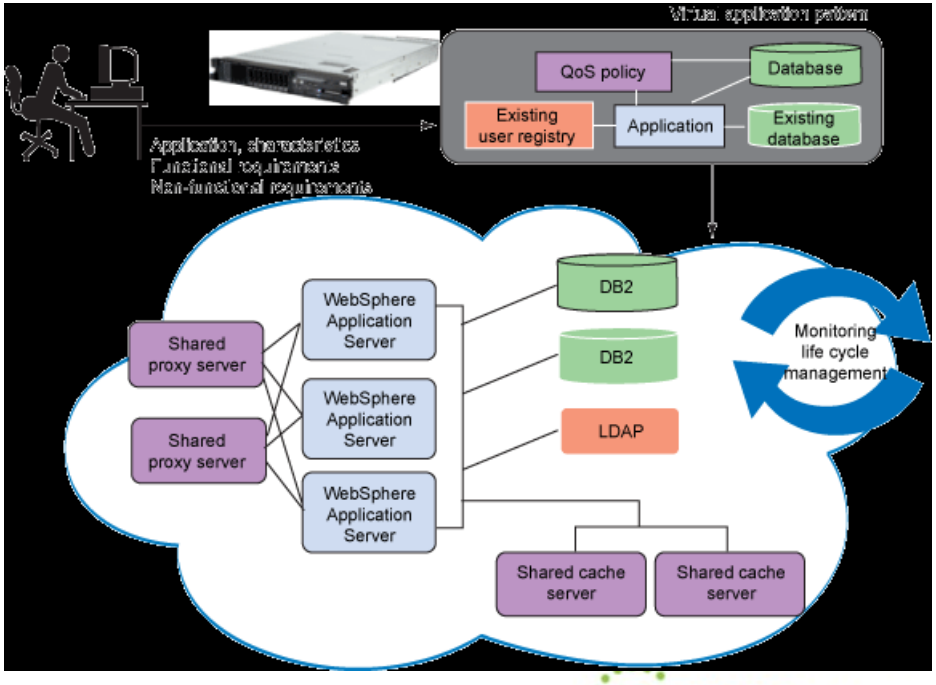
CICS Transaction Gateway
and
IBM Workload Deployer

What is IWD

- IBM appliance for PaaS
- Builds on top of WebSphere Cloudburst Appliance
- Provide ability for Virtual Applications over Virtual Appliances
  - Customer create SaaS

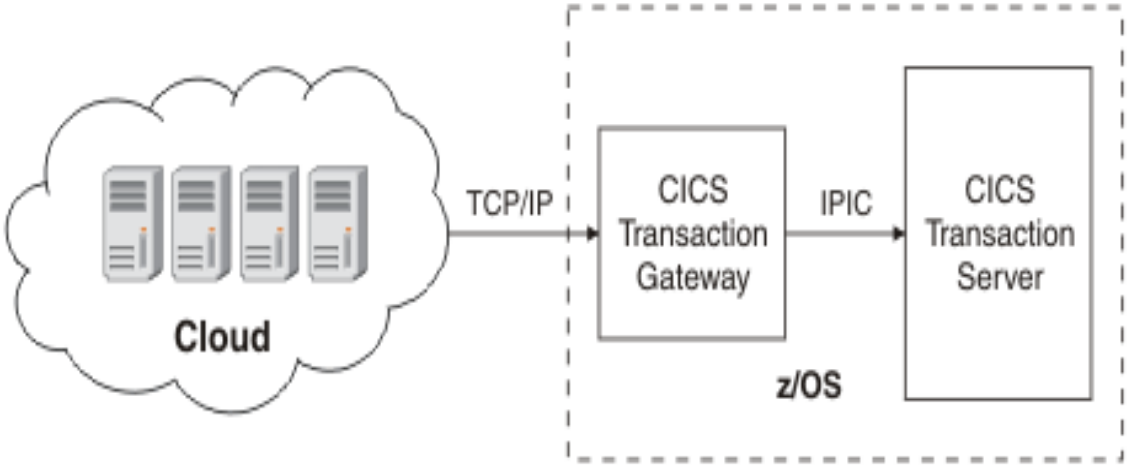
How do customers use it

- Architect application
- Define all parts
  - WebSphere Application Servers
  - Database connections
  - Connections outside the cloud
  - Other IBM technologies
- Add policies
  - Scaling
  - Routing
- Deploy to the cloud



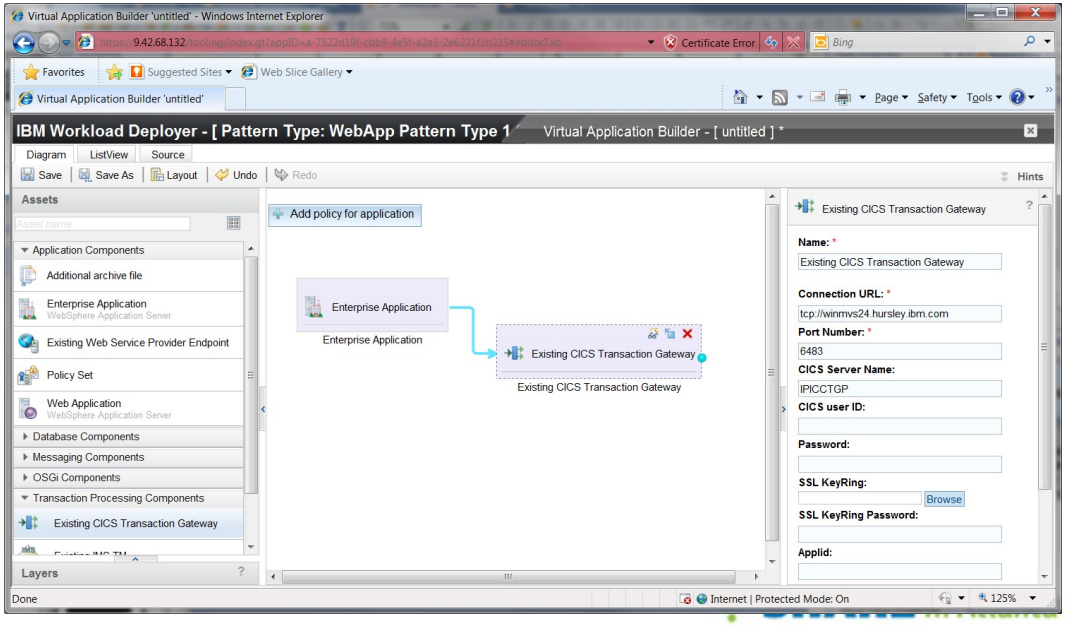
Connecting to CICS

- CICS runs outside the cloud
- Use existing technologies to connect
  - CICS Transaction Gateway
  - Web Services
  - MQ



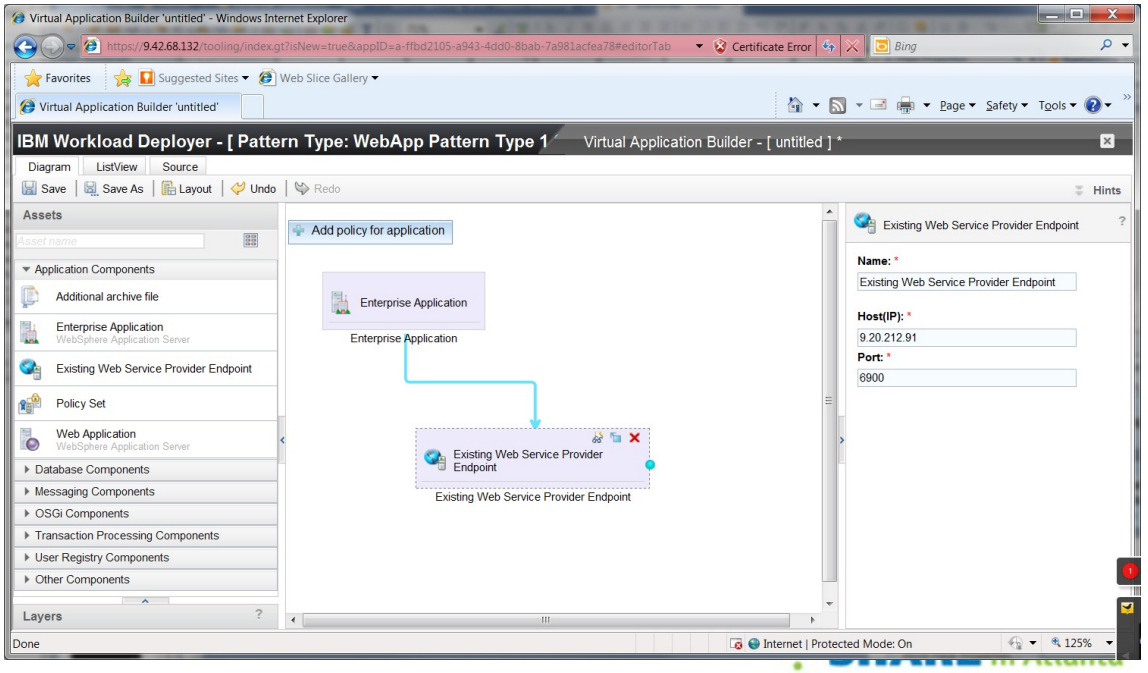
CICS Transaction Gateway

- Connects to CICS TG outside the cloud for CICS connectivity
  - Multi-platform and z/OS
- Installs the JCA Resource Adapter in WebSphere
- IWD configuration details Resource Adapter custom properties
- Connection appears like any other JCA connection



Web Services

- Connect to an existing Web Service
  - Could be CICS or another Web Service provider
- IWD configuration contains location of Web Service end point
- Connection is just like any other WebSphere connecting in.



Questions?