Product presentation

Fujitsu HPC Gateway

SC’16

November 2016
In Brief:

- HPC Gateway Highlights
Convergent Stakeholder Needs

HPC GATEWAY – Intelligent Application Platform

Business Manager
- Full oversight
- Describe, Predict, Prescribe
- Better, Faster Decisions

End User
- Adaptable productive interface, coherent integrated workplace
- Seamless on/off-premise service
- Expert intelligent methods

IT Administrator
- Security and robustness
- Value-adding development
- Efficiency and productivity
Platform for analytics and workflow intelligence

Gateway is a global repository of information on data & applications, methods and processes. Delivers value through refining investment decisions and optimising overall business processes.

Business Management

Continually create and tune business processes
Improve decisions from deeper insight

Intelligent Application Platform

Predict investment
Measure effectiveness

User & Team productivity
Efficient resource management

End-user

IT
Enabling Users in a Hybrid IT World

- Simplicity
- Expertise

- Optimising Application and Business Processes for Hybrid IT frameworks
Analytics For Applications & Processes

- Unites all activities in simulation, modelling, design and analysis in an **Intelligent Application Platform** giving value to every stakeholder

- Immediate results, growing benefits – productivity at first login, accurate usage prediction, prescription of optimal business processes

- Adaptable to business needs – scalable and agile framework enabling HPC services in appliances, private cloud and hybrid IT

- Comprehensive data recording and highly scalable analytical foundation provides deeper insight into the value of application methods and business processes
Automating Business Processes for Cloud
HPC Platform for Hybrid IT

- HPC Gateway uniquely integrates any resources seamlessly into the same continuous user job workflow
- Core scalable database captures application- and process-centric details for more thorough analytics
The Gateway architecture fits within current application and system stacks.

Can be operated without disruption of current environment.

Expert users can migrate progressively into Gateway – first submit existing scripts directly, then onboard as validated methods.

Add-ons can be deployed into an operational Gateway installation.

Extends seamlessly to multiple sites and on/off-premise services.

Core of the architecture is the Gateway Platform Database which stores static and dynamic data – foundation for business analytics.
Most Versatile Integrated Solution for SaaS Cloud

1. On site
   - Web access
   - Gateway

2. Off site
   - Web access
   - Gateway
   - Local resources
   - Corporate private cloud or External cloud provider

3. Off site
   - Web access
   - Gateway
   - Local resources
   - Fujitsu K5 cloud service or External cloud provider
### Operational model 1 - business benefits

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully featured cloud-only based resources</td>
<td>No local infrastructure costs or overheads</td>
</tr>
<tr>
<td>Customize by on-boarding applications</td>
<td>Optimise interface and application base for</td>
</tr>
<tr>
<td></td>
<td>local user needs</td>
</tr>
<tr>
<td>Remotely visualize data and results</td>
<td>No need to move large data sets for local</td>
</tr>
<tr>
<td></td>
<td>analysis</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gateway can be shared across clients</td>
<td>Uniform user management</td>
</tr>
<tr>
<td>Stores all external activity for analytics</td>
<td>Common resources securely shared across</td>
</tr>
<tr>
<td>Provider has complete control over offered</td>
<td>different groups (apps, clusters)</td>
</tr>
<tr>
<td>services</td>
<td>Accounting data collection enabled for</td>
</tr>
<tr>
<td></td>
<td>billing</td>
</tr>
</tbody>
</table>
## Operational model 2 - business benefits

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hosts own Gateway</td>
<td>Workflows run continuously between on and off-premise systems</td>
</tr>
<tr>
<td>Bridgehead to Cloud service</td>
<td>Automated virtual cloud-bursting</td>
</tr>
<tr>
<td>Local applications, own templates in Cloud</td>
<td>More robust and coherent usage</td>
</tr>
<tr>
<td>Simplified operation using same methods for local and remote apps</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gateway can be shared across clients</td>
<td>Uniform user management</td>
</tr>
<tr>
<td>Stores all external activity for analytics</td>
<td>Common resources securely shared across different groups (apps, clusters)</td>
</tr>
<tr>
<td>Provider has complete control over offered services</td>
<td>Accounting data collection enabled for billing</td>
</tr>
</tbody>
</table>
### Operational model 3 - business benefits

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Localised Gateway acts as bridgehead to cloud service</td>
<td>Minimal cost for local infrastructure, ability to add local compute resources, local mgmt users/apps</td>
</tr>
<tr>
<td>On demand usage for overflow or one-off situations</td>
<td>Pay per use services dynamically matched to your usage demands</td>
</tr>
<tr>
<td>Integrated file transfers, app execution and data visualization</td>
<td>All-in-one desktop integration enables simplified and coherent usage</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dynamic infrastructure usage</td>
<td>Uniform user management</td>
</tr>
<tr>
<td>Stores all external activity for analytics</td>
<td>Common resources securely shared across different groups (apps, clusters)</td>
</tr>
<tr>
<td>Provider has complete control over offered services</td>
<td>Accounting data collection enabled for billing</td>
</tr>
</tbody>
</table>
Fujitsu K5 Cloud services

- Operates with multiple service centres around the globe
- Delivers on-demand cloud based IaaS and PaaS services for enterprises and organisations
- Web browser and Web service based access and management
- Pre-defined system images simplifies setup and selection of required resources
- Current usage model dynamically provisions systems on demand for each user request
HPC Gateway embeds Cloud into the Desktop

- Gateway delivers a Software as a Service (SaaS) model from IaaS and PaaS implementations
HPC Gateway – K5 connectivity model

Customer with optional local resources
- Connects to local Gateway instance
- Gateway is connects to K5 service centre
- Seamless usage of the remote apps

K5 HPC - Software As A Service (pay per use)

Fujitsu K5 Cloud service centre

1. Run app. on K5
2. Gateway requests provisioning
3. VM(s) provisioned
4. Gateway runs app
5. Monitor app, browse/visualize results

Copyright 2016 FUJITSU
Gateway Functions
User view at a glance

Intuitive interface
- Web desktop
- Inline wiki docs
- Dashboard option
- Self-defined layout

Applications
- Encoded application methods
- Dynamic and extendable automated workflows
- Record inputs

Mobility
- Mobile device app
- Compact input
- Alerts/progress reports

REST API
- Attach existing GUI
- Integrate with Gateway Platform functions
- Enable command-line actions

Data collection
- Record and track usage
- Identify trends and links
- Optimise processes

Remote Visualisation
- Interactive and lossless transmission of 3D graphics
- Collaboration through team sharing of remote desktop
- Multi-user mode

Monitoring
- Attach existing GUI
- Integrate with Gateway Platform functions
- Enable command-line actions

Projects/Teams
- Structure applications and data around business
- In-built security layer
- Role-based access
Gateway is a Real Global HPC Workplace

- Unique web browser desktop interface – intuitive, comprehensive, adaptable
- Simplifies IT, yet avoid a simplistic working environment
- Enables user from novice to expert to access resources globally through the same platform
- No switching between windows and tools depending on the resource location
- Utilise same application method for local and remote systems
- Drive processes spanning on- and off-premise, with automated file transfer between tasks
First touch – Immediate productivity

- Gateway offers all the basic tools required for working with HPC applications and data
- Delivered via a web browser for maximum simplicity and mobility

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web Desktop</td>
<td>Single workplace, high productivity, intuitive</td>
</tr>
<tr>
<td>Rich file explorer</td>
<td>File type aware, upload/download, multi-server</td>
</tr>
<tr>
<td>Application submission</td>
<td>Optimised methods, stored job profiles, access control</td>
</tr>
<tr>
<td>Task monitor</td>
<td>Full job record, log file view, result directory view</td>
</tr>
<tr>
<td>Data monitor</td>
<td>Simulation data tables, self-service plots</td>
</tr>
<tr>
<td>Cluster watch</td>
<td>Dynamic batch activity, application license check</td>
</tr>
<tr>
<td>Remote terminal</td>
<td>Shell tool, single commands, file pack/unpack</td>
</tr>
</tbody>
</table>
Full Production Dashboard

- Self-service organisation of windows and tools for own operational needs
- Save window arrangement as a workspace
Application Management

- Service interface to methods for applications, processes or workflows
- Controlled view of available methods
- Wiki inline documentation, tooltips for common commands
- Tagging for search and filter
- Easy application onboarding
Addressing needs of different user base

Standard view
- with application controls, basic batch setup and auto/explicit run directory

Advanced view
- detailed batch controls and direct application control file input
User Management

- Access to objects and data controlled by Team and Project structures
- Graphical administration interface
- Identity mapped to system credentials
Dynamic Application Result Monitoring

- Embedded with application method
- Tabular and graph-based tracking of application metrics
- Extraction application dependent
- Self-service plots
Rich File Exploration

- All expected features plus range of useful extras
- Enhanced with file-specific and dynamic functions
- Direct activation of Remote Terminal
- Viewer for image files
- Access controlled by team membership
Add-On Management

- The Add-On function provides a capability to deploy extra tools into an operational HPC Gateway platform.
- Used for modules performing specific functions not included in the base platform.
- For integration of local tools, interactive applications, system monitoring, etc.
- May be provided by Fujitsu or developed in-house.
- Fujitsu Process Mapper deployed as an add-on.
**Process Mapper**

- Drag/drop from Task Monitor or Application Manager to build a process
- Submit whole process or individual steps
- Save and replay or duplicate
- Add tasks to existing process during or after previous task execution
Remote Visualisation Options

Dynamic monitoring within the web desktop

Precision design/engineering with accelerated imaging
Multiple tools exist for remote visualisation, with widely differing capabilities

Fujitsu’s RVEC is built specifically for the needs of technically demanding end-users working with CAD/CAE applications

Ultimate benefits are server and license consolidation, data centralisation, and workforce mobility

RVEC consumes less bandwidth to ensure maximum reactivity and usability across a shared network