Hybrid Cloud

Monitoring and Managing the new demands of Hybrid Applications

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Since our 2012 study, cloud technology has become much more mainstream

In 2012, only 34% said they had a solid plan in adopting cloud.

Today, 78% says cloud initiatives are coordinated or fully integrated.

Level of cloud adoption in respondent’s organization:

- We have redesigned our business process due to cloud: 6%
- We have redesigned our IT infrastructure due to cloud: 7%
- We have adopted or plan to adopt cloud: 21%

How enterprise cloud initiatives are viewed within respondent’s organization:

- Fully integrated as part of an overall strategic transformation: 34%
- Multiple related initiatives within a coordinated program: 44%
- Ad hoc initiatives with some coordination among business group: 19%
- Ad hoc initiatives with no coordination among business group: 3%

The unique business conditions and requirements of each organization defines its optimal hybrid technology landscape

“85% of our IT portfolio will be moved to cloud in 3 to 5 years. The most important 15% will remain in-house.”

*IT Director, Telecommunication, USA*

“...We buy bare-metal type of IaaS and build applications in-house with our customized platforms.”

*CTO, IT Services, USA*

What categories of applications high performing organizations are planning to migrate to an application-as-a-service consumption model in two years:

- Customer Support: 68%
- Finance: 55%
- Sales and Marketing: 40%
- Application development and testing: 39%
- Distribution: 38%

85% of our IT portfolio will be moved to cloud in 3 to 5 years. The most important 15% will remain in-house.
Today’s Hybrid Cloud and their Applications

Seamless portability across any IT landscape using containers enables growth in hybrid applications.

Hybrid Application

End users

Devices

Cloud Workloads

Application Resources on IaaS, PaaS (VMs, containers, Cloud Foundry runtimes, etc)

On Premises Workloads

Middleware
Web Servers, App Servers, ...

Backend
DataBases, Z Backends, ...

Cloud-native

Cloud-enabled
Application Management – Driving forces for change

- The nature & requirements of Applications are evolving…
  - The era of Cloud - requires digital engagement, rapid delivery of client facing applications, and new consumption models with focus on business outcomes and end user experience.
  - Hybrid Applications - Clients in most industries are rapidly moving to models where their applications are hosted in a mixture of On-premises infrastructure and Cloud Infrastructure (public and private, IaaS and PaaS)

- The nature of “managing the application” is evolving…
  - End User Experience - No longer about managing the infrastructure; rather managing the application to ensure the optimal end user experience
  - Analytics - clients are looking for analytics to solve problems even faster
  - Hybrid Management - As with Hybrid Applications, management solutions are increasingly hybrid – hybrid technologies and hybrid delivery models such as on-premises and SaaS
Application Performance Management

Meeting the new Demands

Reducing & Preventing Outages and Slowdowns for the 24/7 Hybrid Application World

Today's Hybrid Application

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On Premises Workloads

Application Performance Management can help

1. **Identify** performance issues beforehand
   - Reduce outages by 50% or more

2. **Isolate** where the problem is occurring
   - Improve availability by 60-90%

3. **Diagnose** for quicker problem resolution
   - Diagnose problems 90% faster

Application Resources on IaaS, PaaS (VMs, containers, Cloud Foundry runtimes, etc)
### Slowest Requests

<table>
<thead>
<tr>
<th>Method</th>
<th>URL</th>
<th>Response Time (ms)</th>
<th>Request Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>/</td>
<td>3</td>
<td>1</td>
</tr>
</tbody>
</table>

### Throughput and Response Time

- **X-axis:** Time
- **Y-axis:** Milliseconds (ms)
- **Graph:** Response Time (ms)
- **Legend:**
  - Blue: Response time (ms)
  - Orange: Request per minute

### CPU Usage

- **X-axis:** Time
- **Y-axis:** Percentage (%)

### Memory Usage

- **X-axis:** Time
- **Y-axis:** Megabytes (MB)
A Comprehensive Monitoring Capability Overview

**Resource Monitoring:** Collects Metrics, Propagates status

**Topology:** Tracks and displays dependencies

**Transaction Tracking:** Gathers/displays response time across components so end-to-end timing is understood

**Diagnostics:** (Deep Dive): Traces/displays methods and timing to get to line of code causing delays

**End User Monitoring:** (Synthetic & Real)
Measures availability & response time from the user perspective, across geographical locations

**Reporting/Analytics:**
- Metric history and trending
- Metrics and logs analysis
- Dynamic baselines
- Predictive analysis

**Applications:** Cloud, mobile, Traditional

**Middleware, Databases, Services**

**Systems & Hypervisors, Network, Storage**
Monitoring Adoption Model

*With clear path to deeper insights for IT Ops, LOBs, Developers*

**IT OPS**

- Identify
  - Synthetic Monitoring
  - Resource Monitoring
  - Predictive Alerts
  - Eventing & Alerting

**LOB**

- Transaction Tracking
- End User Experience Monitoring

**Developers**

- Deep Dive Diagnostics
- Log Search

**Value**

- Correlation of Data and Analytics

**SaaS, On-Premises, or Hybrid deployments**

**Capabilities and insights**
**Synthetic Monitoring – Overview**

**IBM Website Monitoring on Cloud** is a pure SaaS offering for monitoring the availability of your public Internet facing websites from multiple geographically distributed points-of-presence.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
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</table>
| **Script Recording**          | • Record your synthetic transactions visually using a Firefox browser plugin  
                                 | • Built upon industry leading Selenium technology                                                                                     |
| **Script Playback**           | • Uses real browsers which download and run all content, including AJAX  
                                 | • Geographically distributed points-of-presence hosted in IBM SoftLayer data centers                                                  |
| **Real-time Dashboards**      | • Modern web UI  
                                 | • Rapidly diagnose the root cause of an issue                                                                                         |
| **Alerting**                  | • Get notified of availability or performance issues via email  
                                 | • Integrate with on-premises Omnibus                                                                                                 |
| **Self-service Management**   | • Upload synthetic transaction scripts  
                                 | • Configure playback schedules, locations, thresholds and variable                                                                   |
| **Reporting**                 | • Long term historical reporting built upon Cognos                                                                                         |
IBM Operations Analytics – Predictive Insights

**Challenge**: Reacting to performance thresholds is not enough. IT Staffs must become proactive to ensure mission critical applications never go down.

- **Cognitive Intelligence**
  Dynamically learns application and infrastructure behavior; manages thresholds dynamically

- **Anomaly Detection**
  Alerting before potential issues become service impacting, enabling IT to shift from reactive to proactive

- **Forecasting**
  Forecast anomalies and metrics to identify potential critical issues

- **Multivariate Analysis**
  Discover related KPIs for deeper insight and faster mean time to repair
Hybrid Gateway capabilities allow for On-Prem and Cloud Monitoring

- Hybrid Gateway allows you to bring data from an On-prem environments into an IBM Performance Management v8 environment.
- Hybrid GW supports resource monitoring data, but not transaction tracking and deep dive diagnostic data. Use v8 agents for transaction tracking and deep dive diagnostic data.
- Both metric data and events can be visualized in IPM v8
- Uses a single web based console to view metric data & events, leverage Role Based Access Control in the Application Dashboard of the Performance Management server to provide views for operations, the line of business and development.
Both worlds can be displayed

With support for hybrid agents, you now see an icon for the domain where the agent is located, such as these examples:

- IBM Tivoli Monitoring
- IBM Monitoring
- UNKNOWN: No Icon
A Day in the life of IT Operations during a critical IT Outage

**MTTR increasing with application complexity and frequent changes**

Time to first productive action increasing due to tool proliferation and knowledge gaps in first tier IT Ops teams.
The problem we want to **solve** – Reduce MTTR for WebSphere Application Servers with applied Cognitive Capabilities. And at the heart it is about reducing MTTK.

- **Mean Time to Repair** for application-related problems is often **3-6 hours**
- Application outages are too costly. **Average outages last 86mins and cost $450k+**
- Issues that go beyond Level 1 support often involve at least **3-4 people** taking up an average of **5-7 total man hours**
- IT professionals **spend a lot of time figuring out how to surface actionable insights** from massive amounts of data and information
- Hype Cycle for most of IT technologies shows **shorter adoption time for new techno** – that’s increasing **IT staff knowledge requirements**

**Attack the MTTR Long Tail with Cognitive IT Ops Solutions**
Knowledge workers bring benefits to organizations in a variety of important ways.

Vision — Making the boring stuff insightful. Let our AI quickly tell you what you need to know.

Your newest employee

IT Operations Tier 1

IT Operations SME

Cognitive ITOps SME
- Can listen
- Can understand
- Can relate to you
- Can empathize with you
- Is resourceful

est. DOB: early 1H16
A Day in the life of IT Operations during a critical IT Outage

**MTTR decreasing as productive first steps pushed to first responders**

What are the common causes of this error?

What is the resolution for this WAS connection pool error?

What is the command to check connection pool resources?

Natural language interactions remove ambiguity and return best content quickly.
THANK YOU