Deploying Server Virtualization and Managing Dynamic Systems and Services with HP OpenView

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HP WORLD 2003
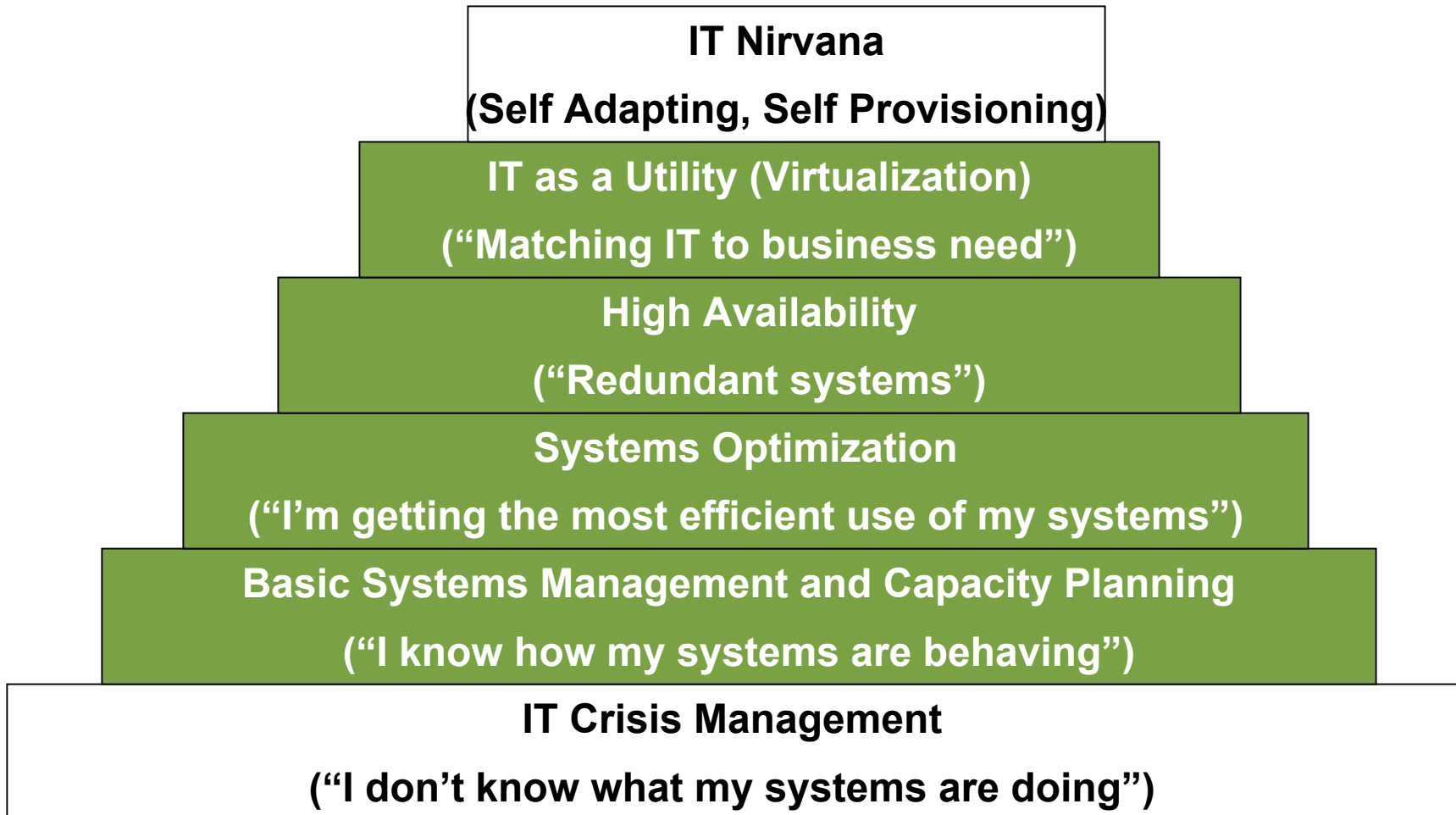Solutions and Technology Conference & Expo

Abstract

- This session covers how to deploy an integration with HP OpenView Service Navigator that allows you to build a dynamic system and services topology map, with real-time performance and utilization statistics across virtual pools of servers and across application transaction paths.

- When integrated into HP Service Desk and Service Information Portal's SLA reporting and management capabilities, the result is real-time management and measurement of SLAs, services and business processes, instead of individual infrastructure elements.

- Session attendees will also learn to enable an automated capacity on demand capability, whereby free servers can be automatically deployed to busy applications to assist in the sudden burst of processing.

- Using the above integration, this capacity on demand capability can be integrated into SLA management. This helps IT staff to manage SLA compliance on both performance and availability metrics, without increasing costs.
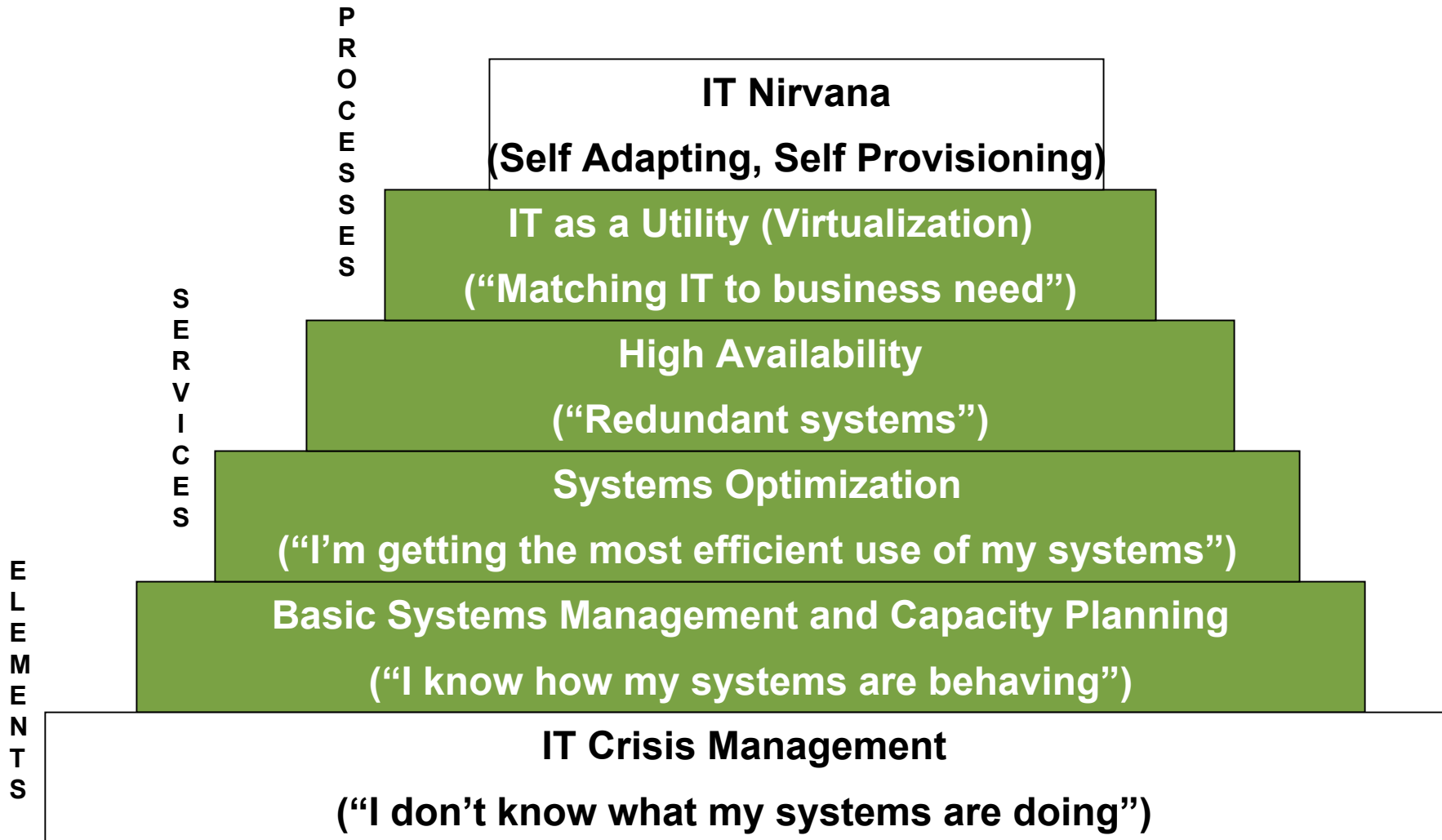
Agenda

- View of the Market

- MetiLinx Innovative Technologies

- Examples, ideas and case studies
  - How to map virtual server pools and system topologies into HP OpenView Service Navigator.
  - How to capture and use performance and transaction metrics to meet SLAs.
  - How to set up an automated capacity on demand operations.
  - How to use Web Services to virtualize and manage IT infrastructure and events.
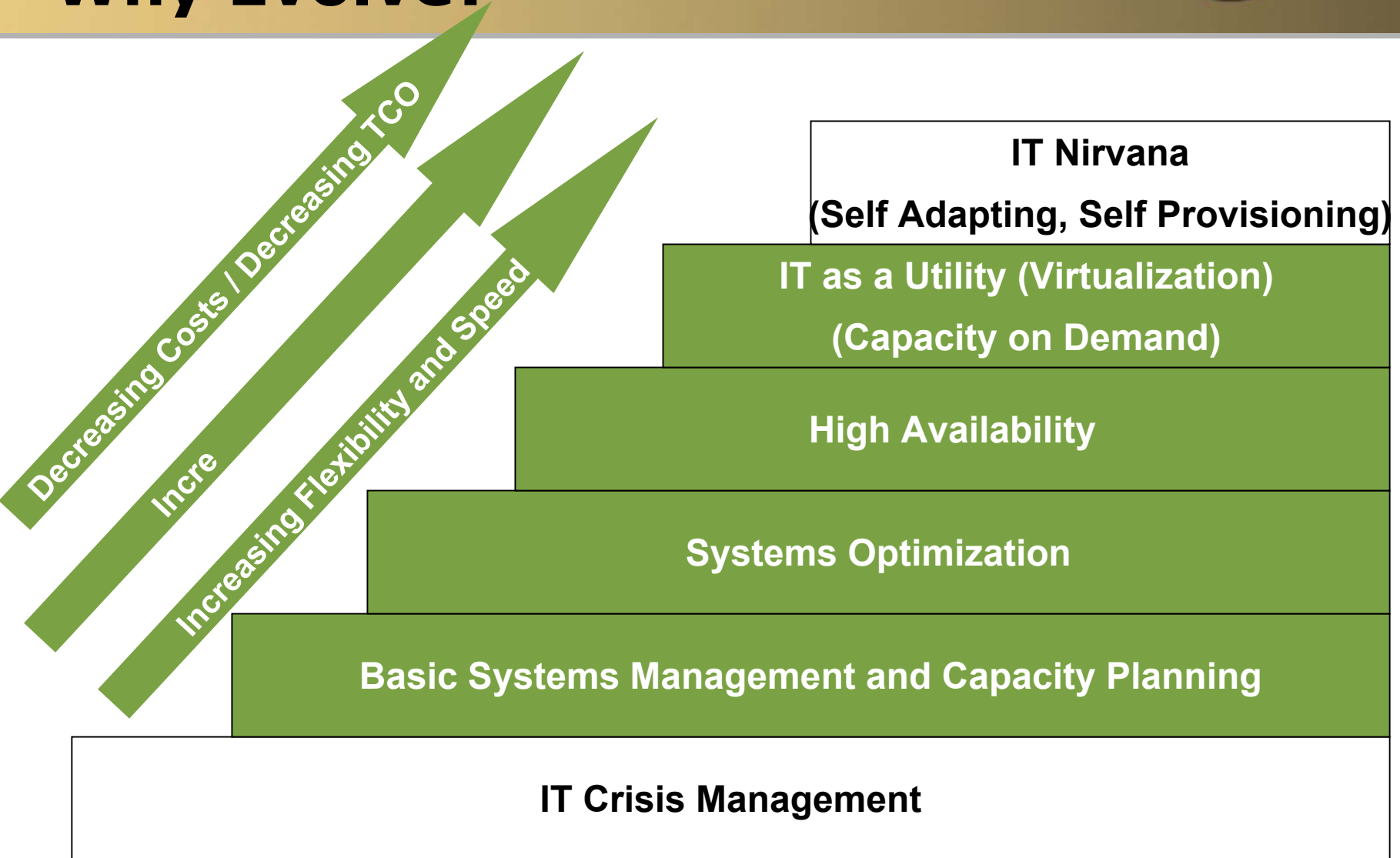
- Demo of Integration to Service Navigator
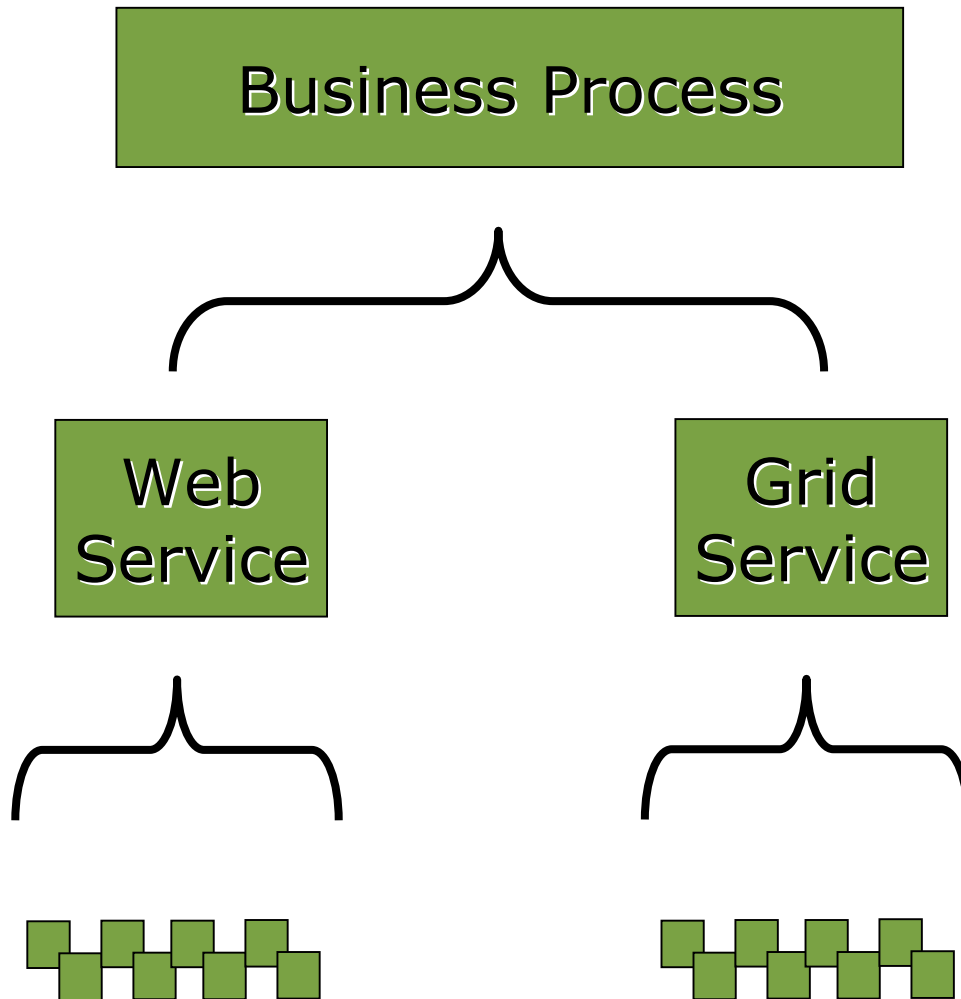
Evolution toward Utility Computing

IT Nirvana

(Self Adapting, Self Provisioning)

IT as a Utility (Virtualization)

("Matching IT to business need")

High Availability

("Redundant systems")

Systems Optimization

("I'm getting the most efficient use of my systems")

Basic Systems Management and Capacity Planning

("I know how my systems are behaving")

IT Crisis Management

("I don't know what my systems are doing")

Managing Processes and Services instead of Elements

PROCESSES

SERVICES

ELEMENTS

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Why Evolve?

IT Nirvana

(Self Adapting, Self Provisioning)

IT as a Utility (Virtualization)

(Capacity on Demand)

High Availability

Systems Optimization

Basic Systems Management and Capacity Planning

IT Crisis Management

Decreasing Costs / Decreasing TCO

Incre

Increasing Flexibility and Speed

Migration to Services from Elements

Business Process

Web Service

Grid Service

Processes

- workflow of services, manual or automatic

Services

- web services, grid services, functional groupings of elements

Elements

- servers, partitions, software, storage, network

Why Not a Big Bang Theory?

- Customers environments are not yet ready

- Customers support teams are not yet ready

- Customers want baby steps
  - Build up the trust
  - Utilize current operations investment to manage current infrastructure (manage elements) as well as new Web services and grid services (manage services)

Progression, with ROI at each step

- Commoditization -> Complexity -> Consolidation

- Optimization and Efficiency

- Virtualization

- Automation

- Built-in intelligence

- IT Linkage to Business

MetiLinx Company Facts

Origins
Founded 1999 as spin-out from a profitable and successful managed technology/service provider.

Solution Focus
Adaptive Infrastructure Management Solutions, System Management and Performance Optimization software

Technology
Deployed on enterprise-class systems since late 1980's

HQ
San Mateo, CA

Privately Held
Significant sales contracts to Fortune 100 and profitable since inception

Key Customers

Strategic Partners

Innovative Foundation Technologies

- **Intelligent object**
  - Holistically measures server/partition utilization 'in-situ', in real-time;
  - Learns about its environment;
  - Intelligently shares its knowledge
  - Autonomous

- **Virtualization of groups of Servers/Partitions**
  - – manage and monitor groups of servers/partitions, or groups of groups

- **Virtualization of transaction path**

- **ALL MetiLinx solutions built on these foundations**

Intelligent System Level Objects

Passively Measures over 400 points at the system level, per second per server.

Integrates analysis system-wide across LAN/WAN and across different Operating Systems

Adaptively updates internal algorithms based on system observation, enabling system to become self-learning and self-healing.

Analyzes Interdependencies of system resources

Identifies the **most available node** within each pool of similar servers at all tiers of the network

No single point of failure.

Transparent to applications; and requires less than 2% of system resources

Front Tier　　　Middle Tier　　　Database Tier
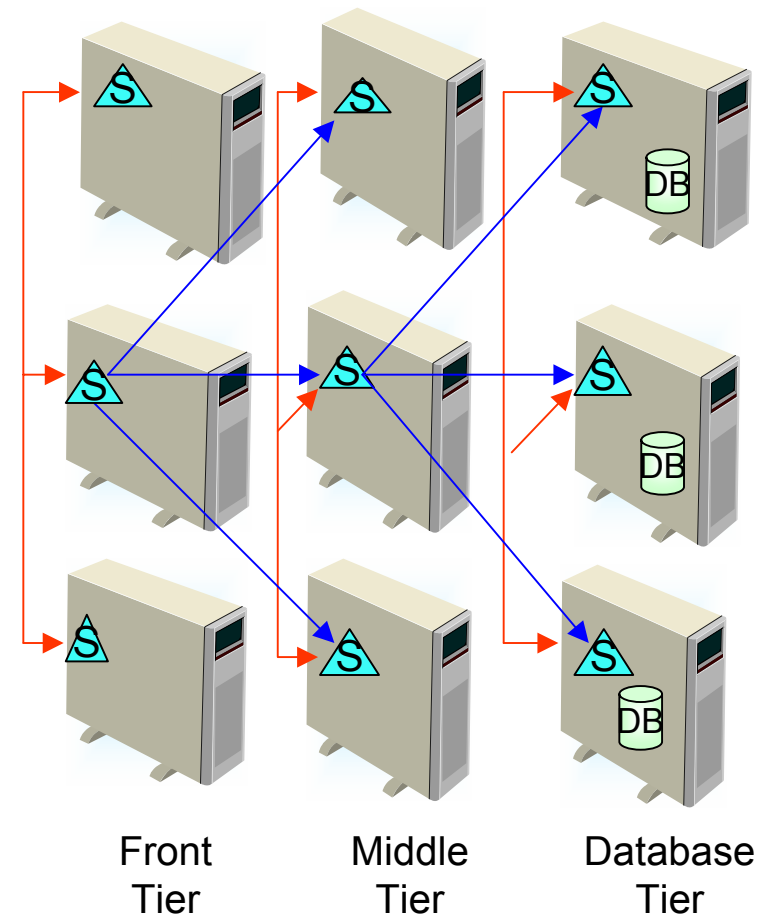
The Power of Adaptive Intelligence

- Temp: 101
- Pulse: 110
- BPM   32
- BP: 165/110
- PH: 7.26
- O_2:   ...
- CO_2:   ...

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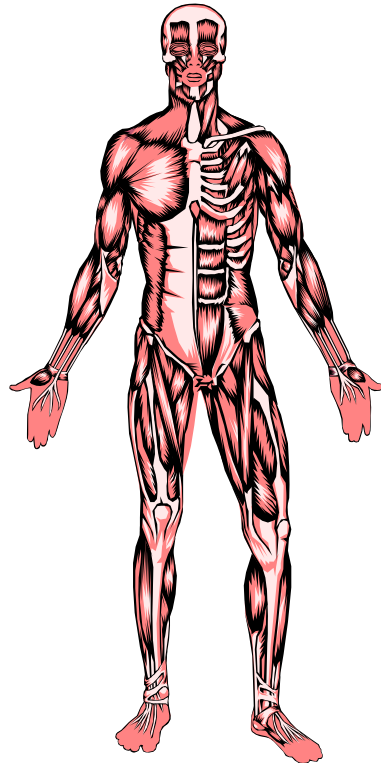
Healthy Man

Just finished jogging
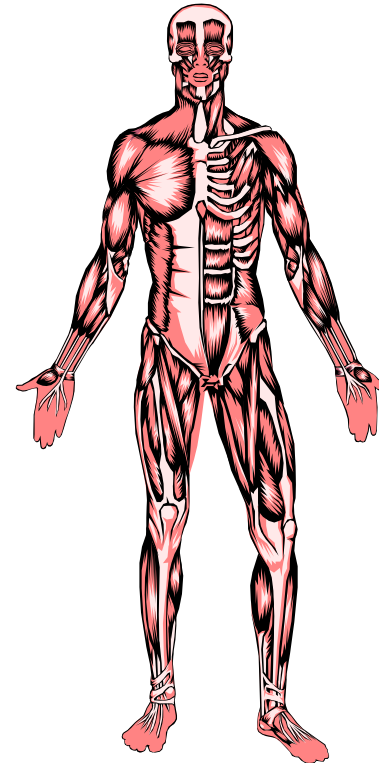
Unhealthy Man

Having a heart attack

MetiLinx understands the overall system impact of multiple interdependent variables, and is able to make accurate evaluations of system health, utilization and performance based on a series of metrics.

Powerful Virtualization Capabilities

- Real-Time visualization of system performance
- Real-Time control of network traffic and server utilization
- Virtualization of server capacity
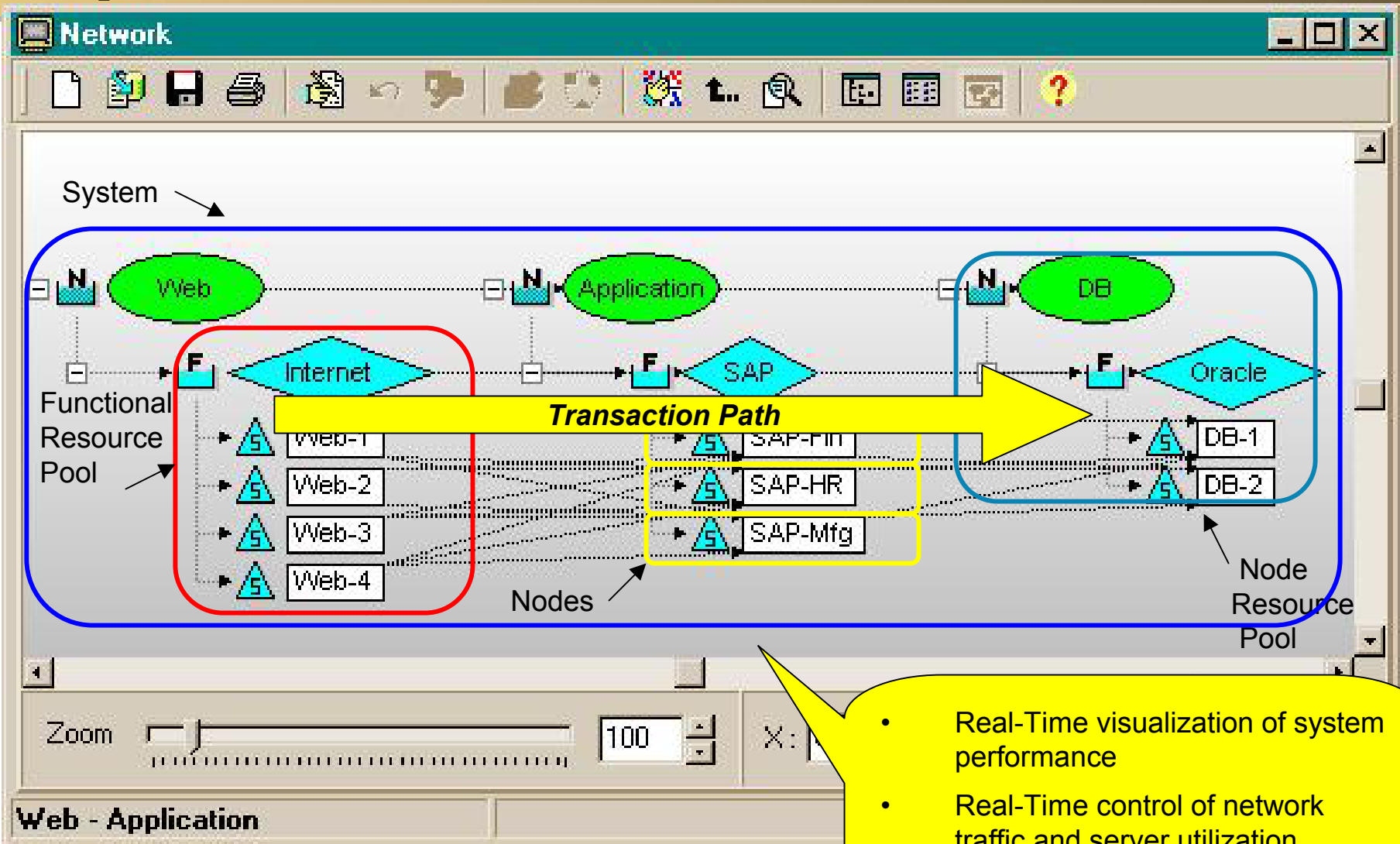
Evolution – the MetiLinx Suite

IT Evolution

IT Nirvana

IT as a Utility (Virtualization)

(MetiLinx ISM)

High Availability

(MetiLinx Synchronization and Data Integrity)

Systems Optimization

(MetiLinx Web and Database Optimization)

Systems Management and Capacity Planning

(MetiLinx Integrated Systems Management)

IT Crisis Management
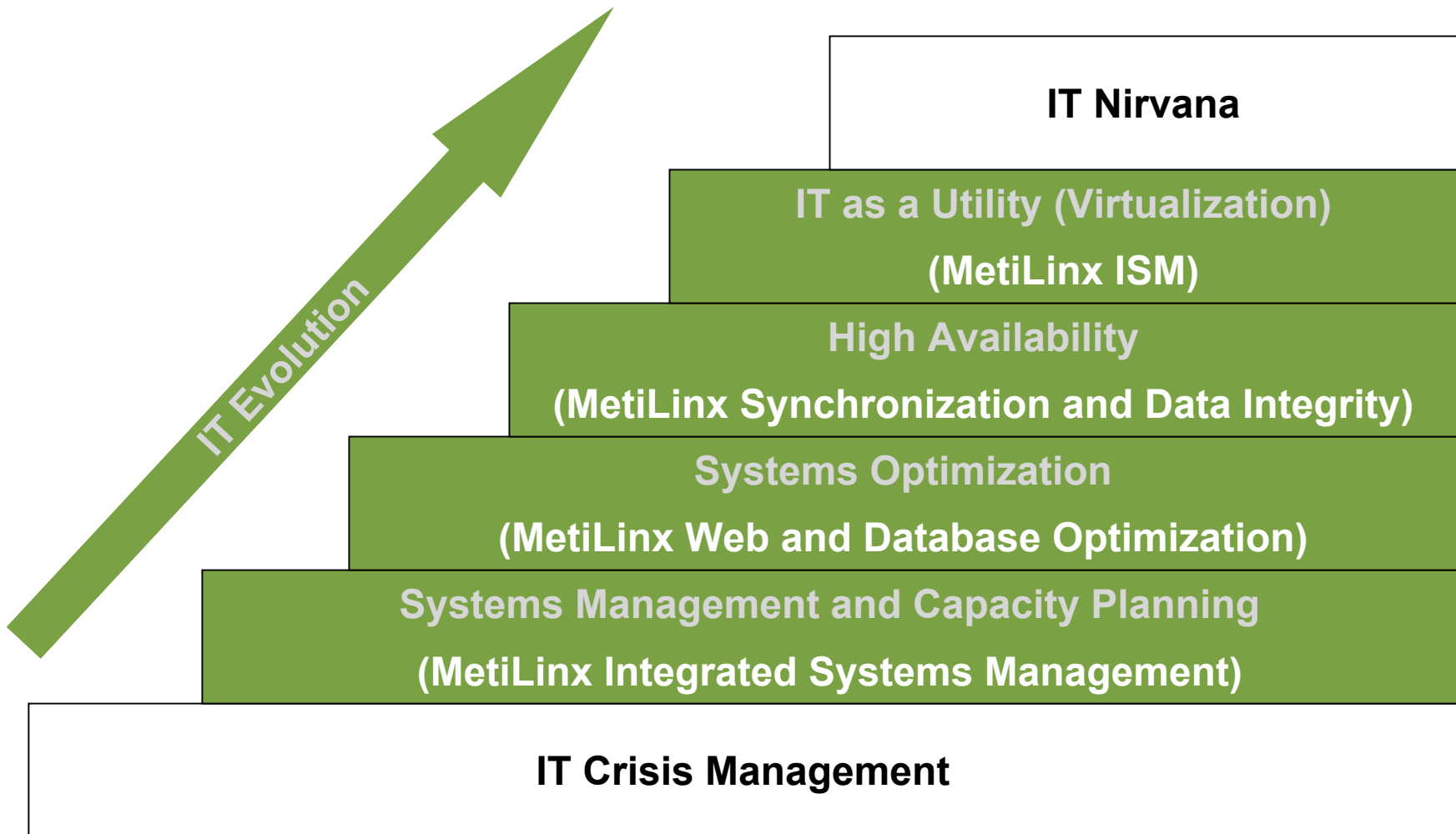
Practical Applications

- Clustered Environments ("outside of the box")
  - Virtualization of Resources into a service (FRP)
  - Management and Measurement at that level
  - Action take when threshold is crossed (launch auto-provisioning)
  - Add server to service

- Partitioned Environments ("inside the box")
  - Virtualization of partitions/domains into a service (FRP)
  - Management and Measurement at that level
  - Action take when threshold is crossed (launch dynamic partition/domain reconfiguration)
  - Add partition or new resources to service

Billing Integration

Resource Unit of Measure:

A Real-Time System Utilization Metric

- An "IP Analyzer" is able to correlate changes in System Resource Utilization to the IP Address that originated the inbound transaction.

- A User Mediation Module ties the IP Address to the user.

- This information can be forwarded as an Electronic Data Record to HP's IUM mediation system, or to a Billing System (ADC's Singl.eView Server Allocation)

Front Tier

Middle Tier

Database Tier

Billing Integration - 2

Billing   Rating   Data Warehouse   Other
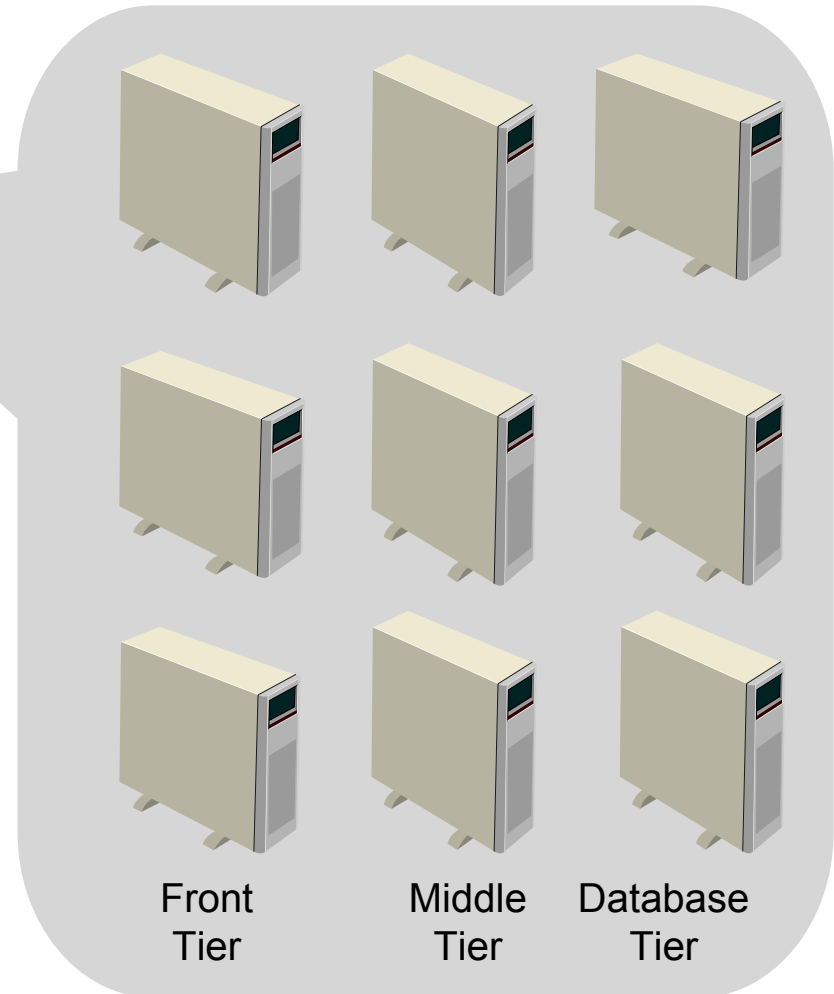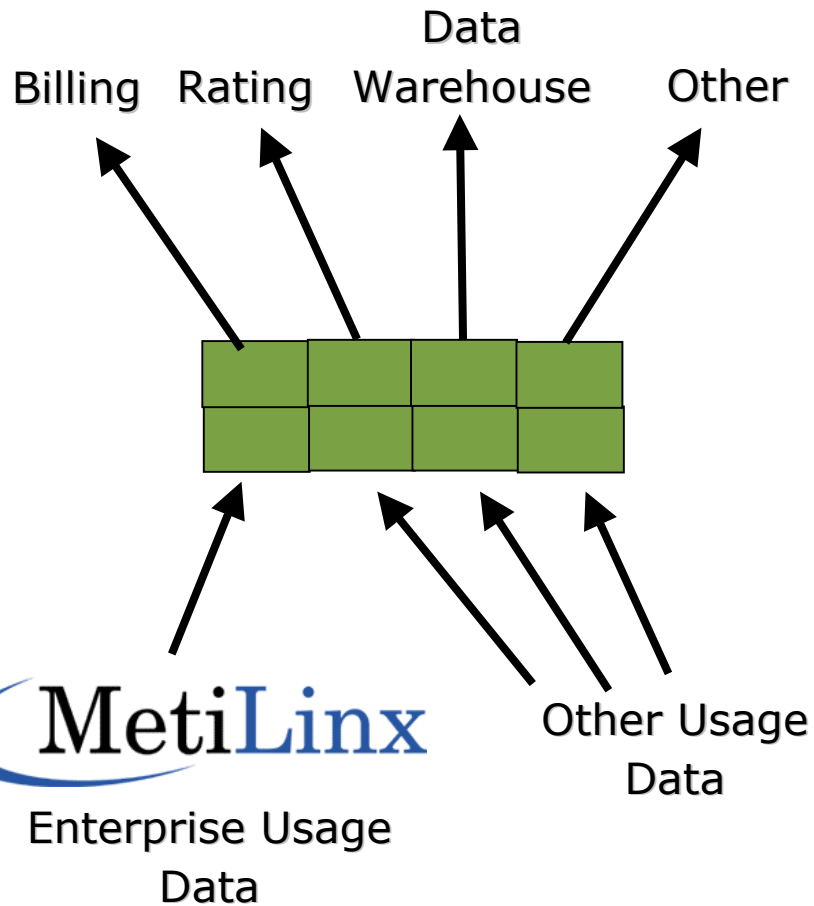
Usage Information Consumers

HP OV Internet Usage Manager (IUM)

MetiLinx

Enterprise Usage Data

Other Usage Data

Usage Information Producers

Examples, ideas and case studies

- Capacity on demand for servers/nodes
- Capacity on demand for web services
- How to map virtual server pools and system topologies into HP OpenView Service Navigator.
- How to capture and use performance and transaction metrics to meet SLAs.

Node Capacity on Demand

Consumer Web

Production Web Servers managed, monitored and load balanced by MetiLinx.

Web 1
Web 2
Web 3
Web 4

Other Workflow Activities

OpenView

Auto Provisioning

FreePool

Node 1
Node 2
Node 3

Free Pool of Servers managed and monitored by MetiLinx.
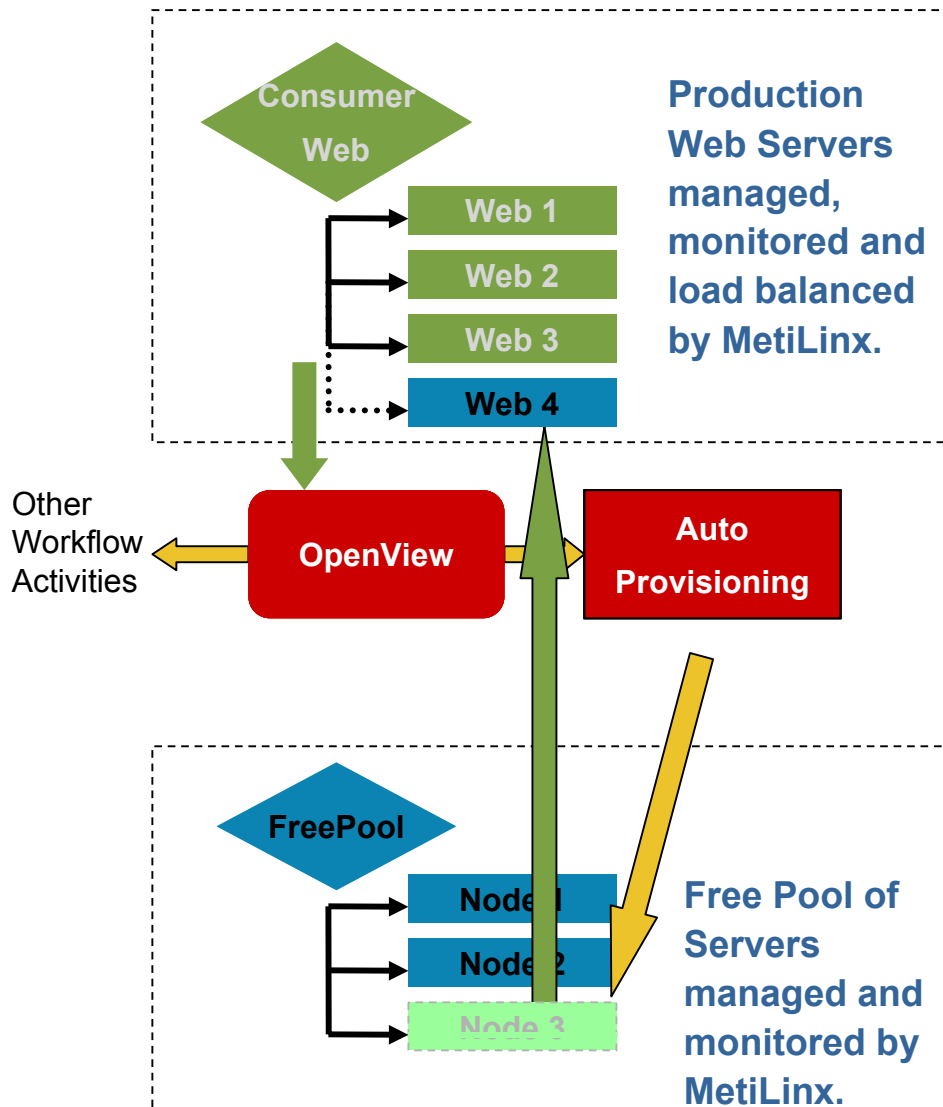
Step 1: MetiLinx detects utilization exceeding SLA, notifies NSM (OpenView)

Step 2: NSM starts workflow, launches Auto-Provisioning (VMWare, Altiris, others)

Step 3: Auto-Provisioning tool takes a ghosted server from Free Pool

Step 4: Automatically, the new server is added to the production pool, and is immediately load balanced with the original pool

Adaptive Web Services Management

- MetiLinx and Digital Evolution integration
  - Digital Evolution – Enterprise Class Web Services Management
    - Services Oriented Architecture (SOE) Management and Security platform
    - UDDI 3.0 Directory (DEMS Registry)
    - policy based security for registry access
  - MetiLinx integration into HP Open View Operations (OVO)

- Adaptive Web Services Management integrated into OVO: True Services Management

Web Service Capacity on Demand

Application Servers

Production Web Services managed, monitored and load balanced by MetiLinx.

WS1

WS1 WS2

WS3

WS1

OpenView

Web services management engines

Web Services Management

Web Services Repository
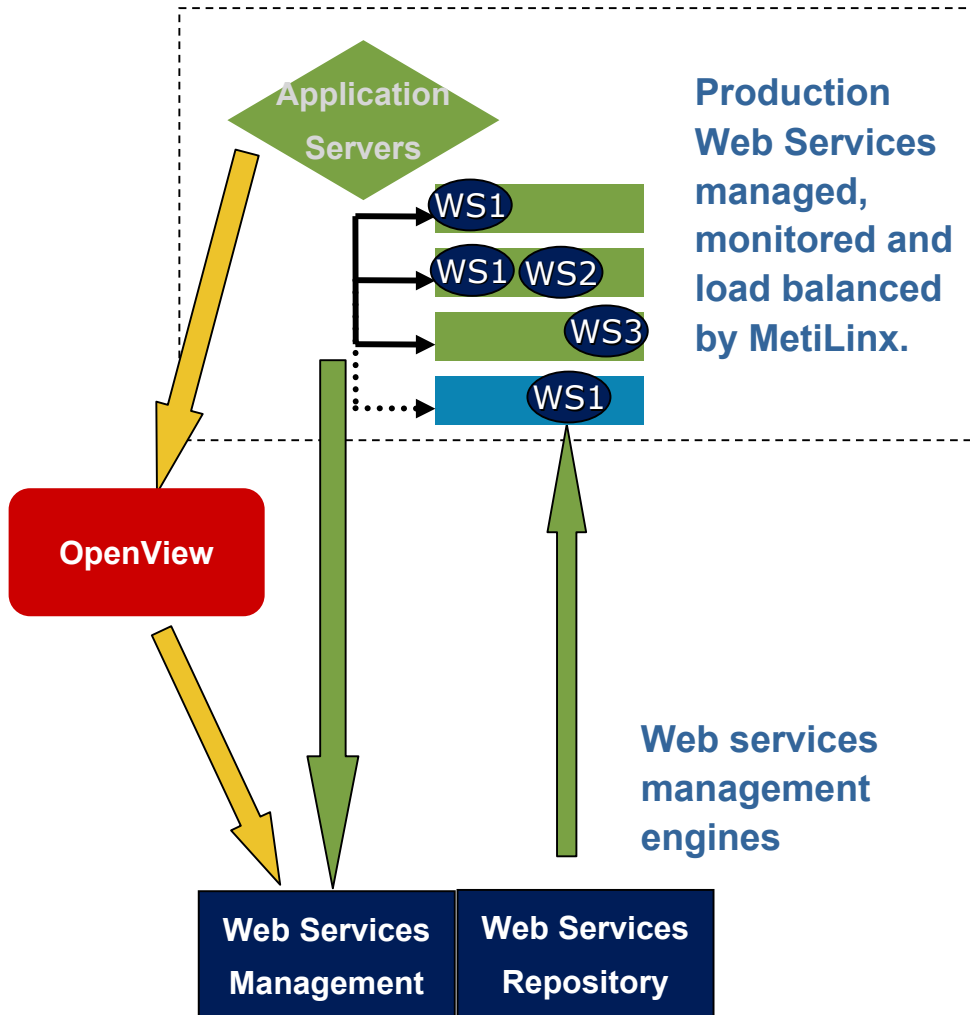
Step 1: MetiLinx detects web service utilization exceeding SLA, notifies NSM (OpenView)

Step 2: MetiLinx starts workflow, either launches new node Auto-Provisioning (if additional node capacity is needed) or addition of web service onto existing node

Step 3: The Web service instance is registered in the UDDI-compliant repository and automatically managed

Step 4: Automatically, the new web service is added to the production pool, and is immediately load balanced with the original pool

Web Services Billing Integration

Web Services Usage Billing:

MetiLinx and Digital Evolution Integration

- The system can correlate changes in Web Services Resource Utilization to the user that originated the web service call

- This information can be forwarded as an Electronic Data Record to HP's IUM mediation system, or to a Billing System (ADC's Singl.eView Server Allocation)

- Used for billing, chargebacks, contracts

WS1
WS1
WS2

WS1
WS2
WS2

WS3
WS2

Front Tier   Middle Tier   Database Tier
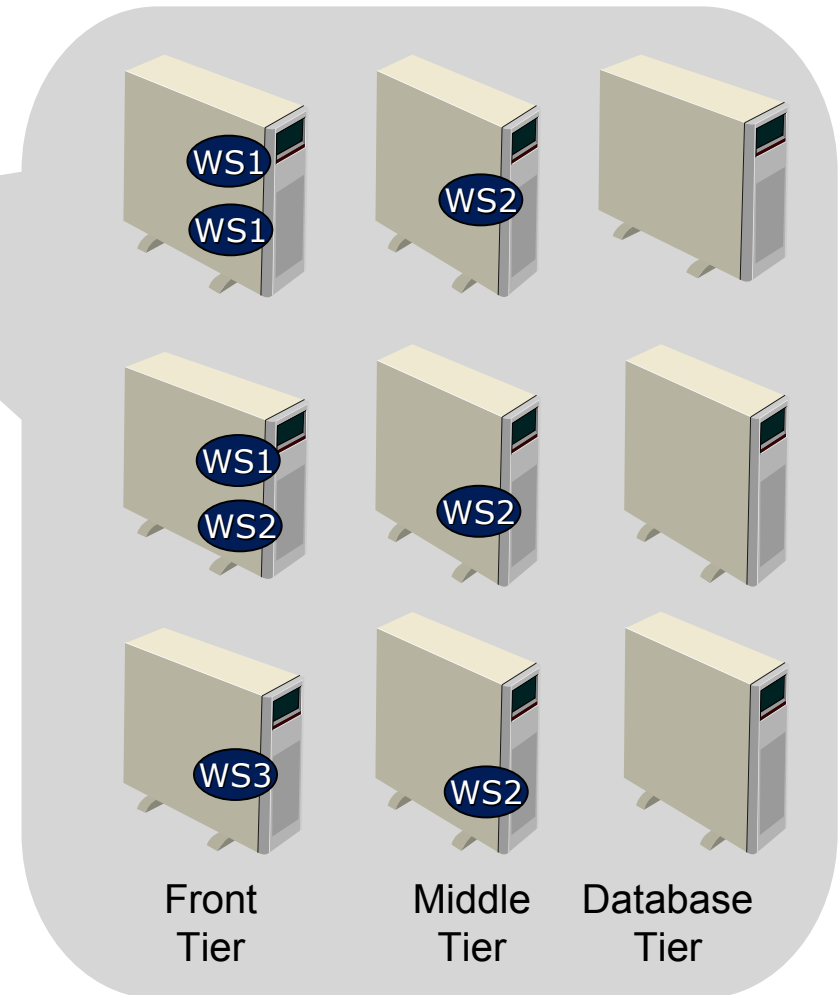
Screen Shot – HP OVO w/MetiLinx virtualization integration

Screen Shot – Web Services Virtualization

Points of Integration – HP Open View

- ## **Open View Operations**
  - Service Navigator: integration of elements making up services
  - Provides virtualization integration, including reflection of real-time changes in virtualized nodes, monitoring and alerting to set of workflow for capacity on demand.
  - Alerting – Network Node Manager, OV Operations
  - On virtualized pools of servers or single servers

- ## Virtualized usage metrics
  - Billing/usage information – HP OV Internet Usage Manager
  - IUM = usage-based billing for convergent (voice/data, wireless and wireline) services
  - MetiLinx DCM Billing = usage-based utilization information for systems

Demo of Integration to Service Navigator at MetiLinx Booth #524

Case Study: HP

invent

"MetiLinx is poised to transform the way networks are planned, managed, grown and used to their maximum effectiveness…
I have been in the IT profession for over 30+ years and this is one of those products that I would classify as breakthrough."

- Bob Napier,
- CIO & SVP,

Context / Problem:

- HP/Compaq merger forced consolidation of two sophisticated – and different – IT organizations
- Aggressive growth in each organization had been addressed by adding hardware
- Systems were becoming more costly and difficult to manage
- Required means to identify and consolidate servers while optimizing remaining ones

MetiLinx Solution:

- MetiLinx installed iSE across Compaq's systems to identify where problems were on the system and to dynamically correct them. Bottlenecks and performance issues became identified and corrected immediately.
- Identified that HP was only using 25% of total system resources
- Reallocated under-utilized hardware to increase balance and utilization
- Identified numerous application-related resource issues
- Reducing hardware by 20%. Performance increases as high as 42%.

Case Study: Intellinex

Intellinex
Learning for growth

"We chose MetiLinx for scalability, reliability and speed. MetiLinx can deliver mainframe-class performance at PC prices.
When we put MetiLinx on our network, we achieved 40% greater scalability with existing hardware."

- Mark Bockeloh
- Sr. VP of Technology

Context / Problem:

- Client base of 650,000 users, 6,000 concurrent users using large multimedia files
- Customers include Amex, Chase, Cisco, Coca Cola, J&J
- Systems needed to be available at all times, all locations
- Video streaming, heavy database transactions over LAN/WAN
- 4 Geographically dispersed web farms

MetiLinx Solution:

- Intellinex has achieved 99.999% availability (4 minutes unplanned downtime) over past 15 months
- 46% less hardware
- 54% savings in total costs

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