IBM Operations Manager for z/VM
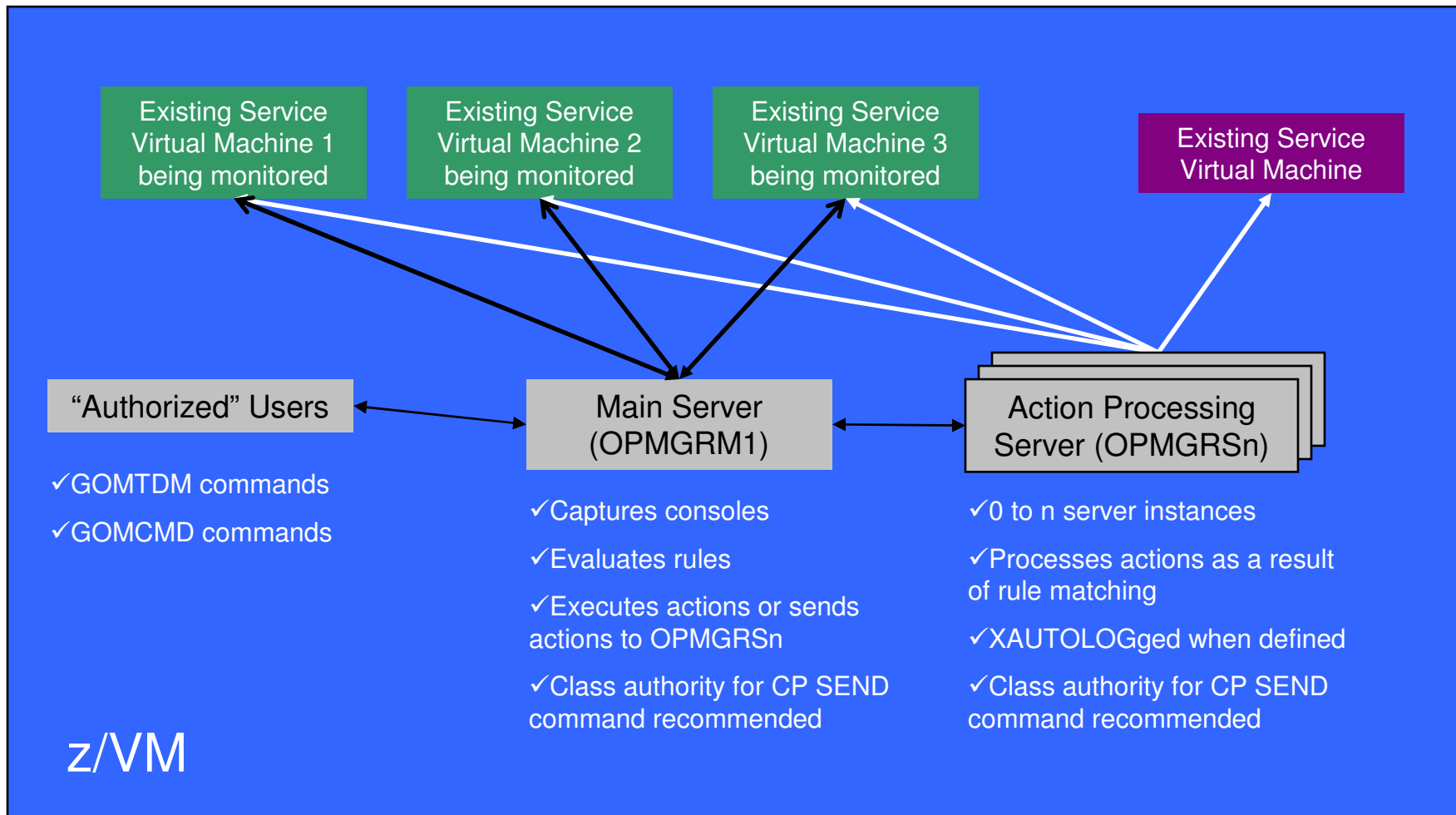
Tracy Dean, IBM

September 2006

Agenda

- **Operations Manager for z/VM**

  – Overview

  – Key benefits

  – Features and functions

  – Summary

  – Demo

Overview

- **Monitor service machines**
  - Capture console messages
  - Take predefined actions based on message text matching
  - Suppress messages from the console view
  - Hold or highlight messages with color, blinking, etc.
- **Schedule events/actions**
  - To occur on a regular schedule
  - To occur immediately
- **Automate multi-step tasks**
- **Dynamic configuration**
- **Multiple installations of Operations Manager on one z/VM system**
  - Performance (monitoring a large number of consoles)
  - Separation of access control

Operations Manager

Existing Service Virtual Machine 1 being monitored	Existing Service Virtual Machine 2 being monitored	Existing Service Virtual Machine 3 being monitored	Existing Service Virtual Machine

"Authorized" Users

✓GOMTDM commands

✓GOMCMD commands

Main Server (OPMGRM1)

✓Captures consoles

✓Evaluates rules

✓Executes actions or sends actions to OPMGRSn

✓Class authority for CP SEND command recommended

Action Processing Server (OPMGRSn)

✓0 to n server instances

✓Processes actions as a result of rule matching

✓XAUTOLOGged when defined

✓Class authority for CP SEND command recommended

z/VM

Key Benefits

- **Automation, automation, automation**
  - Routine tasks
    - Starting guest systems
    - Scheduling backups
  - Respond to predictable situations requiring some form of intervention
    - Route warning messages to users, administrators, or programmers
    - Re-ipl a service machine
    - Archive service machine log files to tape when approaching disk full
- **Increase productivity**
  - System administrators and operators focus on business-critical activities rather than routine maintenance tasks
  - Users receive faster response to typical roadblocks
  - Routine off-shift activities can be done more effectively with minimal operations staff
- **Improve system availability**
  - Monitor virtual machines and processes
    - Action instead of reaction
  - Reduce problems due to operator error
- **Resolve problems faster**

Features and Functions

- **Monitor service machines**

- **Schedule events/actions**

- **Automate multi-step tasks**

- **Access control**

- **Dynamic configuration**

- **Integration with other IBM products**

Monitor Service Machines

- **Monitor logon status of specified user IDs**
- **Take action if logged off to bring it to logged on status**

```
DEFMMON NAME(SFS),USER(BKRSFS),ACTION(LOGONUSR),INTERVAL(5),PARM(BKRSFS),DAYS(*******)
```

Monitor BKRSFS every 5 minutes every day for LOGOFF status

If logged off, issue the LOGONUSR action with the parameter BKRSFS.

```
DEFMMON NAME(TAPEMGR),USER(TMTMM),ACTION(LOGONUSR),INTERVAL(10),PARM(TMTMM),DAYS(*T*TF**H)
```

Monitor TMTMM every 10 minutes on Mon, Wed, Sat, Sun (except holidays) for LOGOFF status

If logged off, issue the LOGONUSR action with the parameter TMTMM.

Monitor Service Machines

- **Capture console messages**
  - Must SECUSER to Operations Manager server
  - Data spaces used to hold contents of captured console
    - Console messages passed from data space to user/admin when view is requested
    - One data space per monitored console
  - Daily log includes captured message and meta data
    - Text, length, IUCV class, source

Monitor Service Machines

- **Define rules to**

  - Scan console messages for text matching

    - Includes column, wildcard, and exclusion support

  - Take actions based on matches

- **Multiple rules can apply to one message**

  - Rules processed in order of definition in the configuration file

  - FINAL option available to indicate no additional rules should be evaluated

---

In Operations Manager configuration file:
`DEFRULE NAME(CPREAD),MATCH(*HCP*150A*CP*),MCOL(001:020),ACTION(CPREAD)`

Monitor Service Machines

- **Predefined actions**
  - Suppress message from data space (thus console view)
    - Always sent to the log
  - Highlight message with color, blinking, etc.
  - Hold messages
    - Don't scroll off the top of the screen when viewing the console and auto scroll is on
    - User must explicitly clear the message
- **Customer defined actions**
  - CP or CMS command, or EXEC to be executed
- **View consoles via GOMCMD command**
  - Authorized users can view individual consoles or a set of consoles
  - "Fullscreen mode"
    - Scroll up and down
    - Auto scroll (on or off) as new output is displayed on the console
    - From command line, issue commands back to the monitored console
- **View log of all console activity via GOMCMD command**

Monitor Service Machines

- **Take action**

  – Define an action to run

    - On the main Operations Manager server
    - On any available action processing server
    - On a specific action processing server
      – For example, a server that has the required authority

---

In Operations Manager configuration file:
```
DEFACTN NAME(ARCHVLOG),COMMAND(EXEC LOGARCHV &U &P),OUTPUT(LOG,CRE),ENV(OPMGRS02)
```

Define an action called ARCHVLOG that will:
- Execute the EXEC LOGARCHV
- Pass the user ID of the message originator
- Pass the parameter provided by the rule that invoked this action (disk address)
- Add the matching message to monitored console in data space
- Set message to red in console (data space)
- Place console output of LOGARCHV EXEC in Operations Manager log
- Execute the command on OPMGRS02, an Operations Manager worker server

Schedule Events and Actions

- **Define schedules to execute**
  - At a specific time
    - Hourly at a specified number of minutes past the hour
    - Daily at a specified time
    - Weekly on a specified day of the week and at a specified time
    - Monthly on a specified day of the month and at a specified time
    - Yearly on a specified month and day and at a specified time
    - Once on specified month, day, year, and time
  - At regular intervals
    - Every x hours and y minutes
  - Within a specified window of time
    - Specify start time
    - Specify conflicting schedules
    - Specify maximum time to defer this schedule, waiting for conflicts/dependencies
    - No execution for this occurrence of the schedule if maximum time is reached
  - Within limits
    - Restrict to specific days of the week: Monday through Sunday plus holidays
    - Restrict to certain hours of the day

Schedule Events and Actions

- **Time based on local time of system**

  – Same as Query TIME

- **Specify the action associated with the schedule**

  – Actions specified are the same as those for console rules

- **Only future schedules are activated on startup**

  – Won't execute a schedule defined for earlier today that has reached its maximum deferral

  – Will execute it at its next occurrence

Schedule Events and Actions

In Operations Manager configuration file:
`DEFSCHD NAME(HEALTH),ACTION(CHECKSYS),EVERY(03:00),DAYS(MTWTF**H)`

Define a schedule called HEALTH that will execute the CHECKSYS action every 3 hours, starting at server startup, on Saturdays and Sundays, except holidays.

In Operations Manager configuration file:
`DEFACTN NAME(CHECKSYS),COMMAND(EXEC SYSTATUS),OUTPUT(LOG),ENV(OPMGRS02)`

Define an action called CHECKSYS that will:
- Execute SYSTATUS EXEC
- Put the console output of the SYSTATUS EXEC in a special data space called SCHEDULE
- Place the console output of SYSTATUS EXEC in the log
- Execute this action on a specific action processing server: OPMGRS02

Automate Multi-step Tasks

- **Logon to user IDs and perform multiple tasks or steps**
  - Verify responses or status as you go

- **Use Operations Manager Terminal Device Management (TDM)**
  - Create scripts (REXX EXECs) to logon to a user and perform specific actions
  - EXEC contains special calls to Operations Manager GOMTDM functions
    - OPTION
      - Set up the environment for this session
    - INIT
      - Start a new session at this z/VM system's logon screen and return session id
    - INPUT
      - Enter data at specified position and hit specified key on keyboard
    - QUERY
      - Get information about the session
    - TERM
      - End a session specified by a handle

Dynamic Configuration

- **Initial configuration defined in a configuration file**

  – Nested configuration files are allowed

- **Authorized users dynamically update configuration**

  – Issue commands to main server (OPMGRM1) via SMSG

  – Must be authorized to use command issued

- **Dynamic configuration changes not retained if server shut down or recycled**

  – Permanent changes must also be made to the configuration file

Access Control

- **Users defined with access to one or more:**
  - Control commands
    - Manage the Operations Manager infrastructure
    - Define additional service machines to execute actions
    - Authorize users
    - Display status
    - Issue CP and CMS commands on an Operations Manager service machine
    - Define data space sizes
  - Configuration commands
    - Define rules, schedules, actions
    - Define holidays
    - Define user IDs to monitor for logoff status
    - Define groups
  - Consoles
    - Access to monitored consoles

Access Control

- **Additional access based on access to modules**
  - GOMCMD: issue commands to Operations Manager server and return output
    - View consoles or view the log
    - Change configuration
    - Must be authorized to the commands issued
  - GOMTDM: terminal device management

- **Security defined and managed by**
  - Operations Manager internal definitions, or
  - RACF or other External Security Manager
    - Uses RACROUTE
    - New Facility classes for
      - Control authorization
      - Configuration authorization
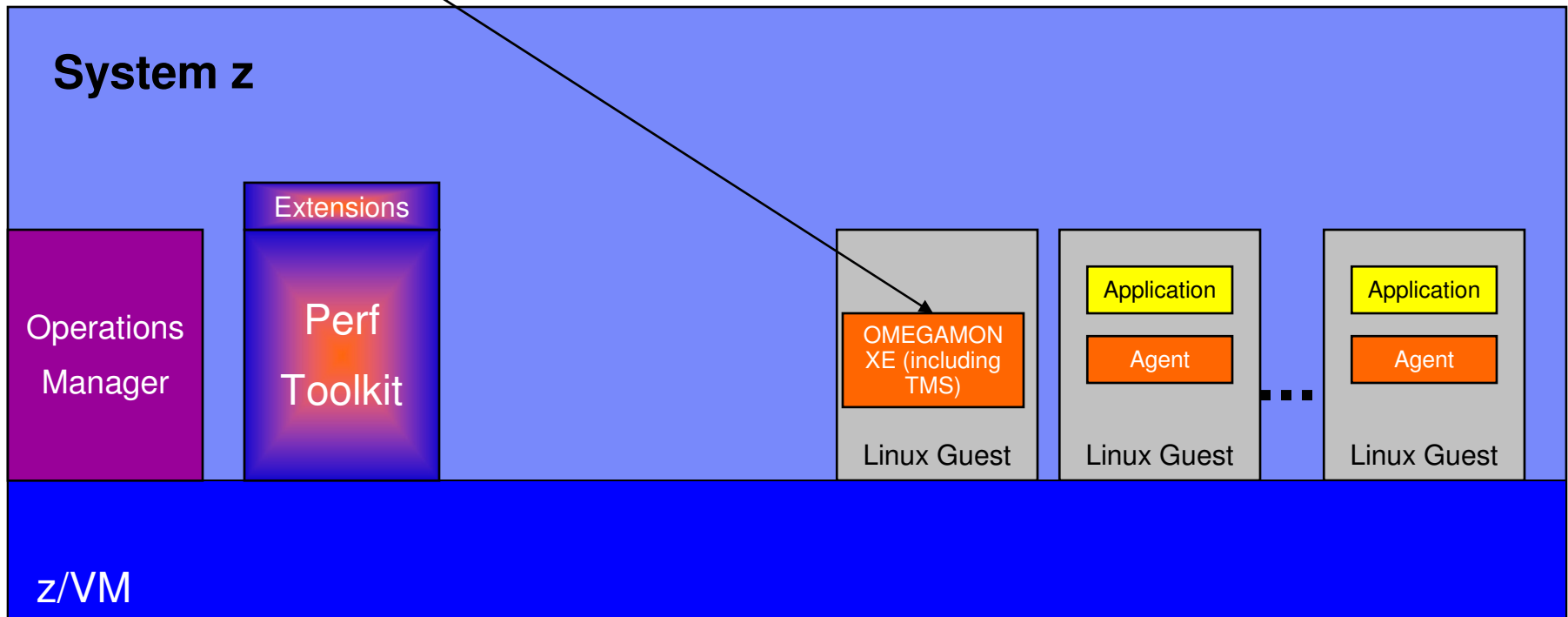   - Console authorization

Integration with Other IBM Products
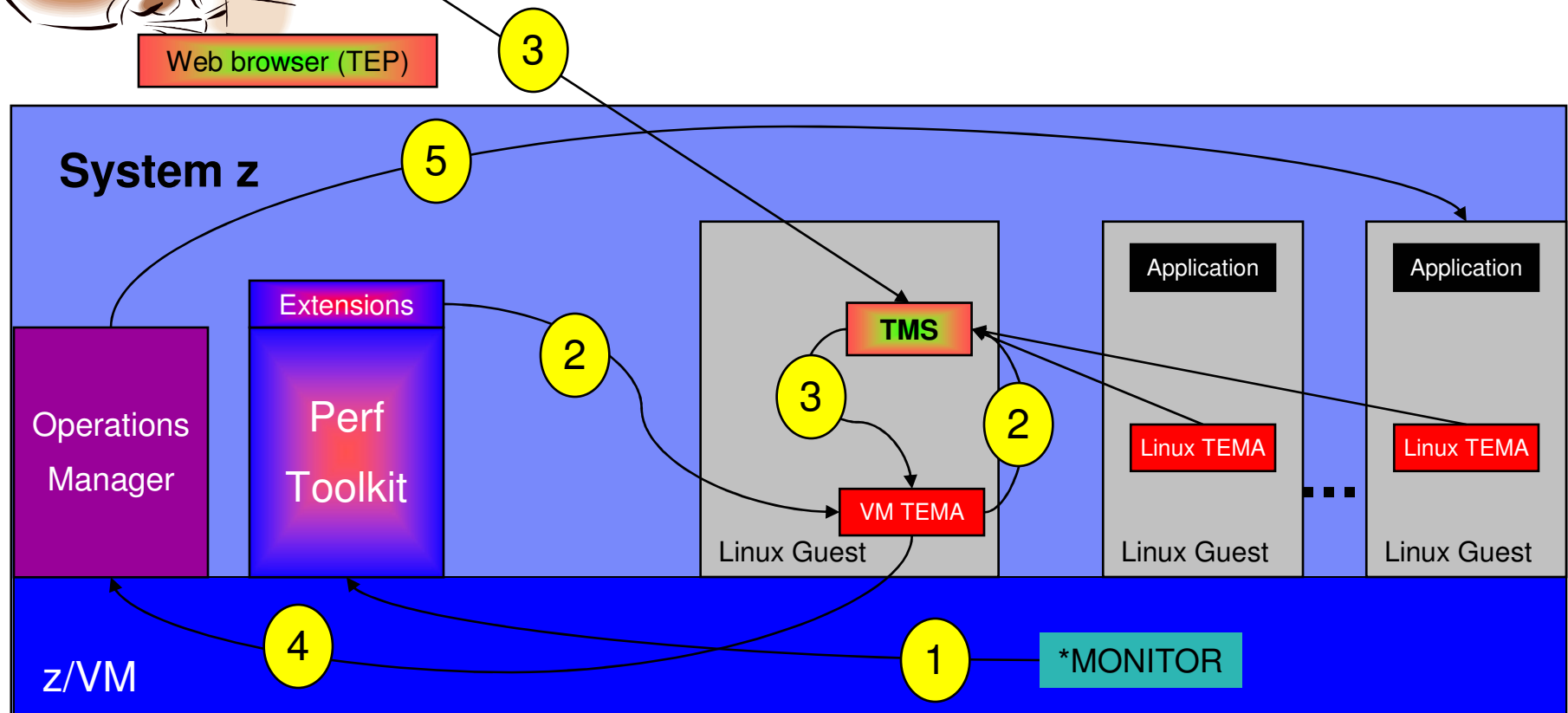
OMEGAMON XE on z/VM and Linux

- z/VM agent (Tivoli Enterprise Management Agent)
  - ✓ Command processor
  - ✓ Monitoring agent
- Tivoli Management Services (TMS), multiplatform
  - ✓ Tivoli Enterprise Portal (TEP), a browser-based interface
  - ✓ Agents (TEMAs), including VM and Linux on System z
  - ✓ Additional components, multiplatform

Web browser

System z

Extensions

Operations Manager

Perf Toolkit

OMEGAMON XE (including TMS)

Linux Guest

Application

Agent

Linux Guest

Application

Agent

Linux Guest

z/VM

OMEGAMON XE and Operations Manager for z/VM

Process Flow

Web browser (TEP)

System z

Extensions

Perf Toolkit

Operations Manager

TMS

Application

Application

Linux TEMA

Linux TEMA

VM TEMA

Linux Guest

Linux Guest

Linux Guest

*MONITOR

z/VM

Operations Manager Summary

- **Assist with automated operations**

  - Monitoring user IDs for logoff status

  - Monitoring service machine consoles

  - Taking actions based on console text matching

  - Scheduling actions

- **Upcoming focus on integration with Tivoli system management portfolio**

- **Demo**

Demo

- **DIRMAINT log disk exceeds threshold**

  – We'll force this to happen for demo purposes

- **DIRMAINT runs hourly check for threshold**

  – We'll run the check manually due to timing of the demo

- **If threshold exceeded, warning message is displayed on DIRMAINT console**

- **Operations Manager automatically takes action based on this message**

  – Shuts down DIRMAINT

  – Sends the log files to another user ID (for archiving)

  – Restarts DIRMAINT