



Application Management Webinar

Daniela Field

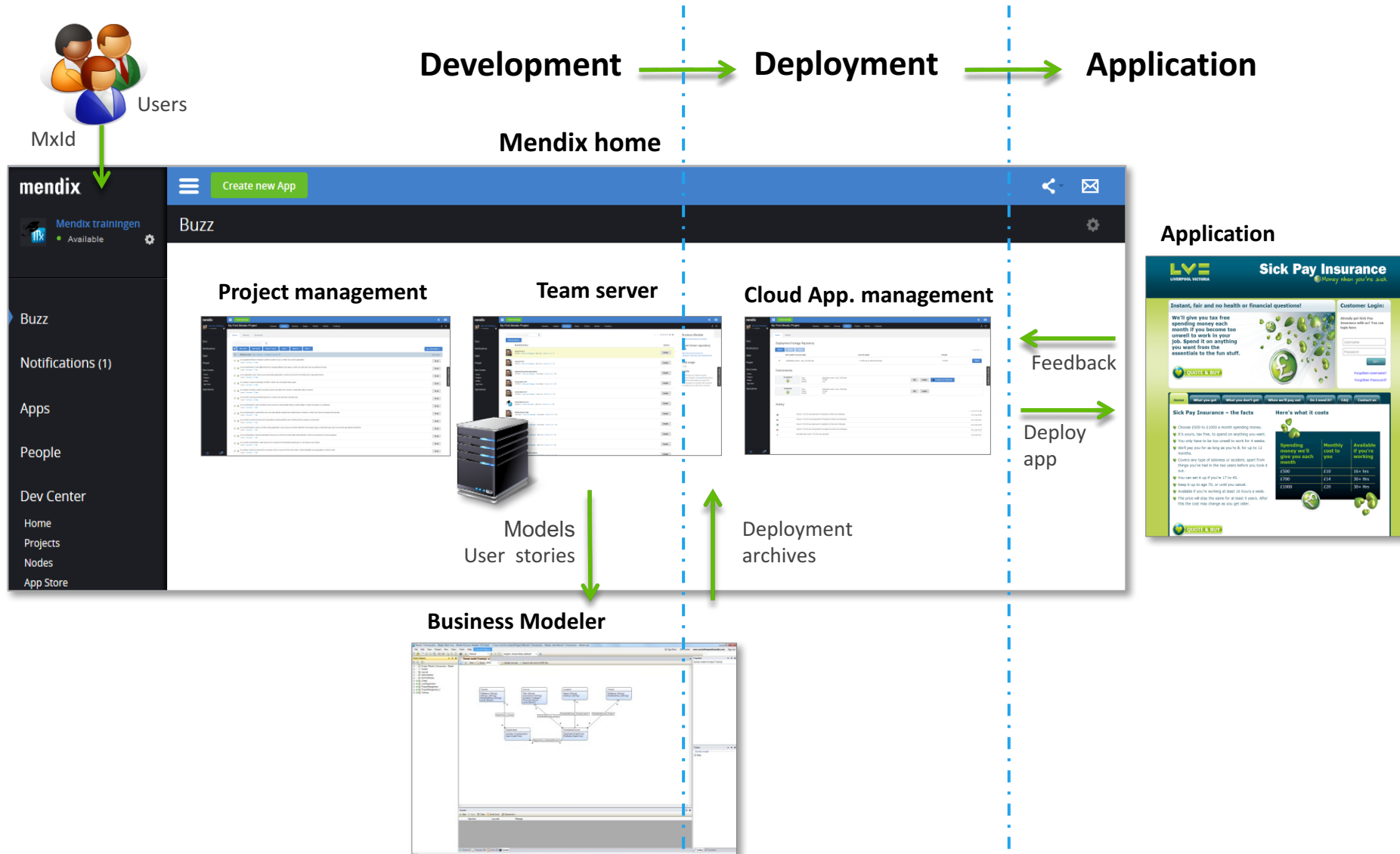
Agenda

- ▶ Agile Deployment
- ▶ Project vs Node Security
- ▶ Deployment
- ▶ Cloud Administration
- ▶ Monitoring
- ▶ Logging
- ▶ Alerting



Cloud Overview

Cloud Overview – Project Management



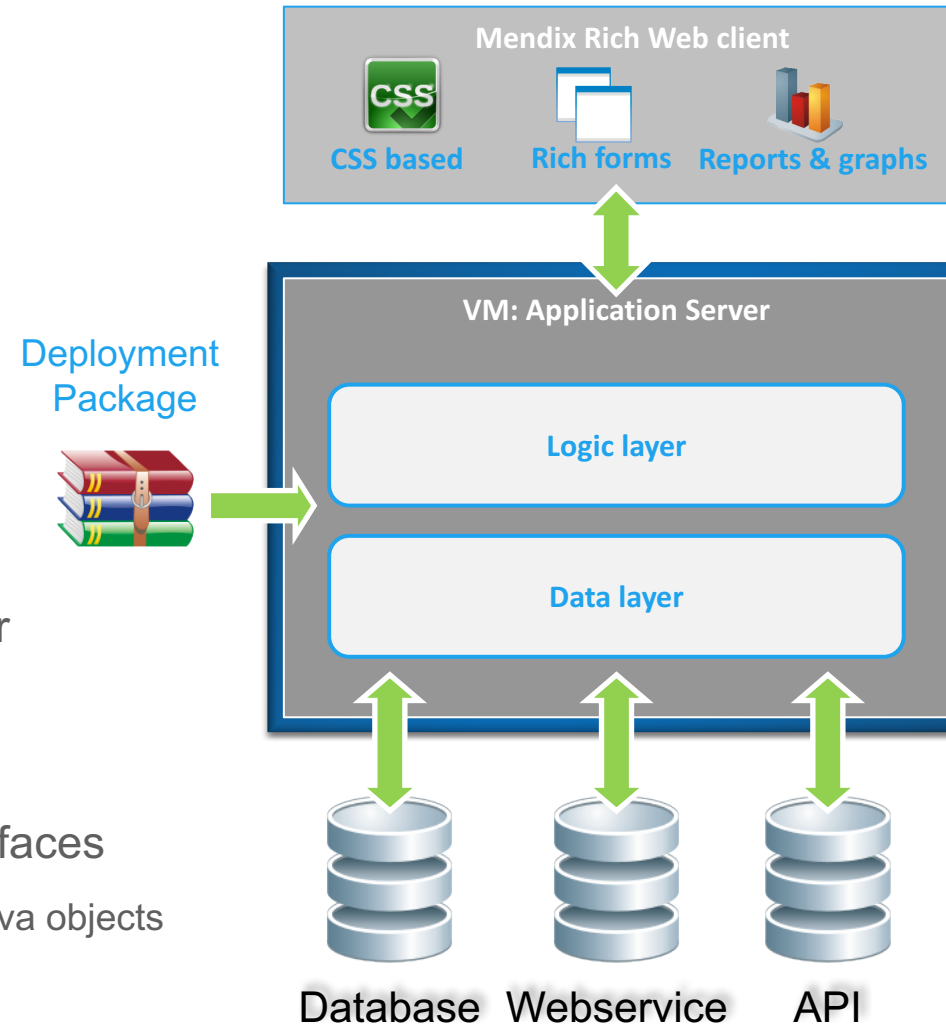
Cloud Overview – Inside the app environment

Web client (user interface)

- ▶ Runs in browser (AJAX)
- ▶ CSS based
- ▶ Plug-in structure

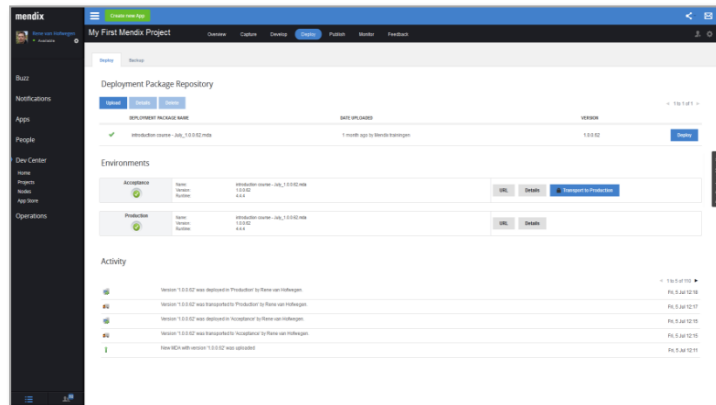
Application server

- ▶ Executes model
- ▶ Separation between logic & data layer
- ▶ Transforms data to domain model (Mx objects) from different sources
- ▶ Exposes logic & data to different interfaces
 - HTTP, web services, Java; JSON, XML, Java objects



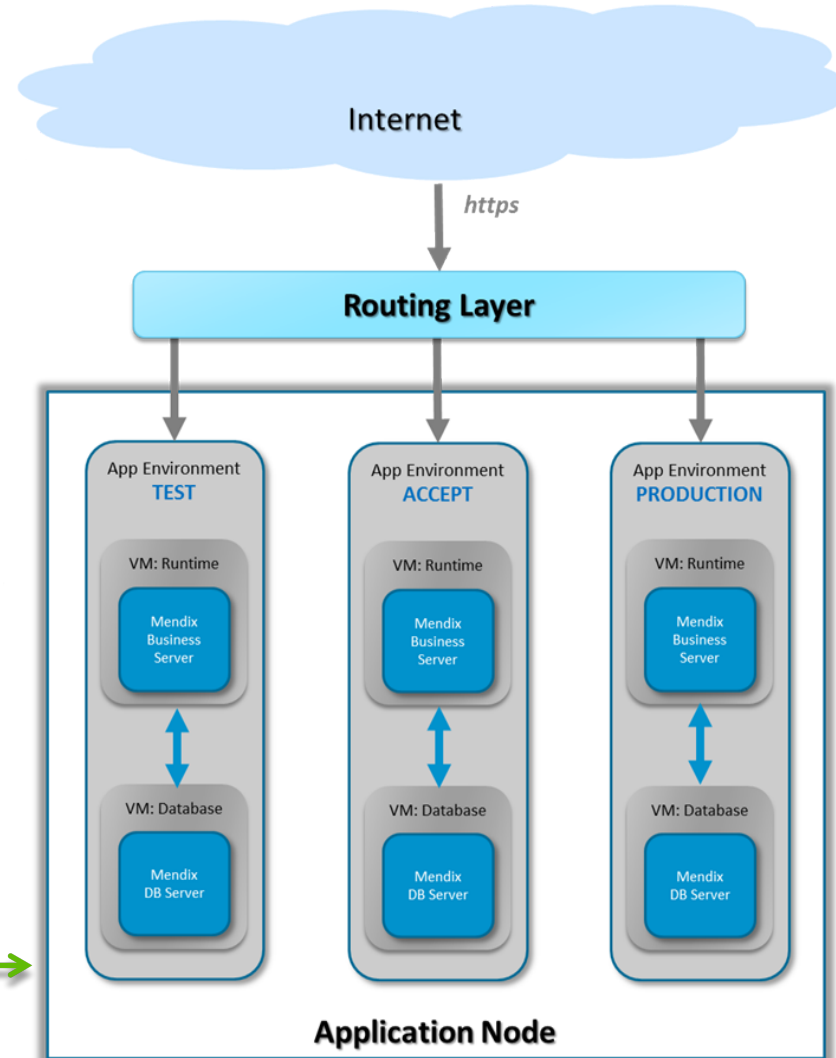
Cloud Overview – Cloud Setup

Mendix cloud Management



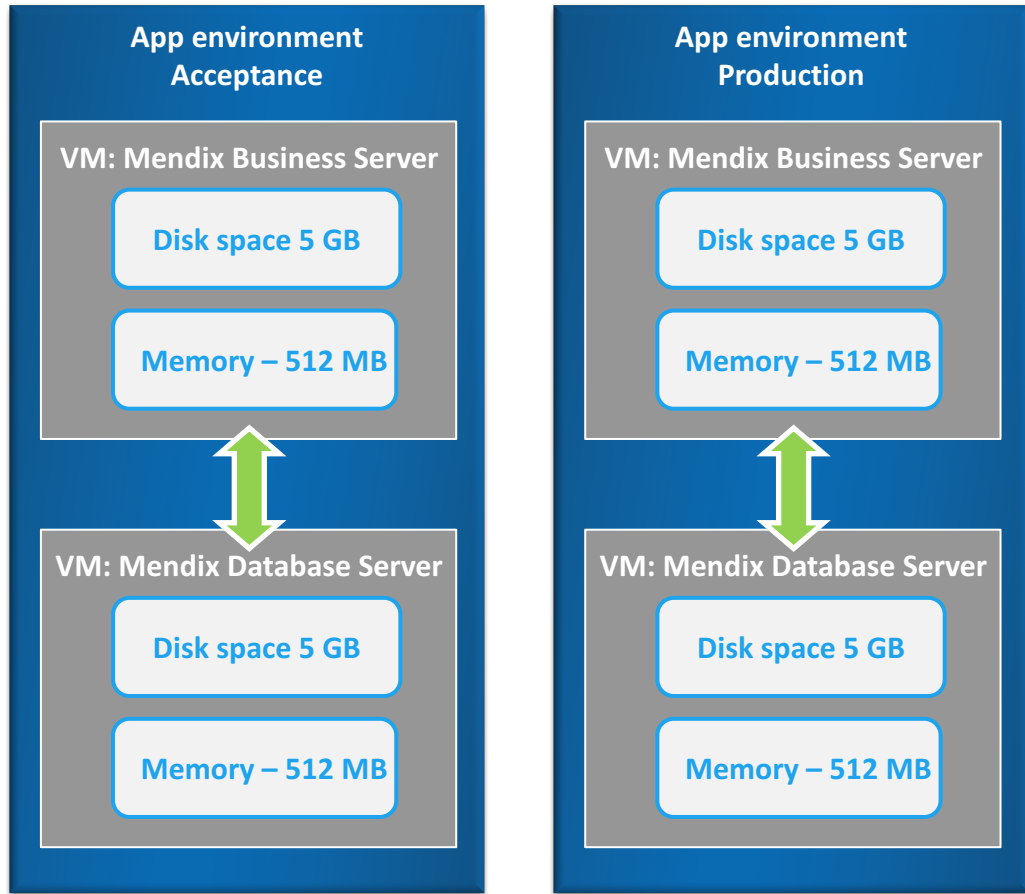
Management (start, stop, backup – restore)
Monitoring & initialization

Mendix Node Controller



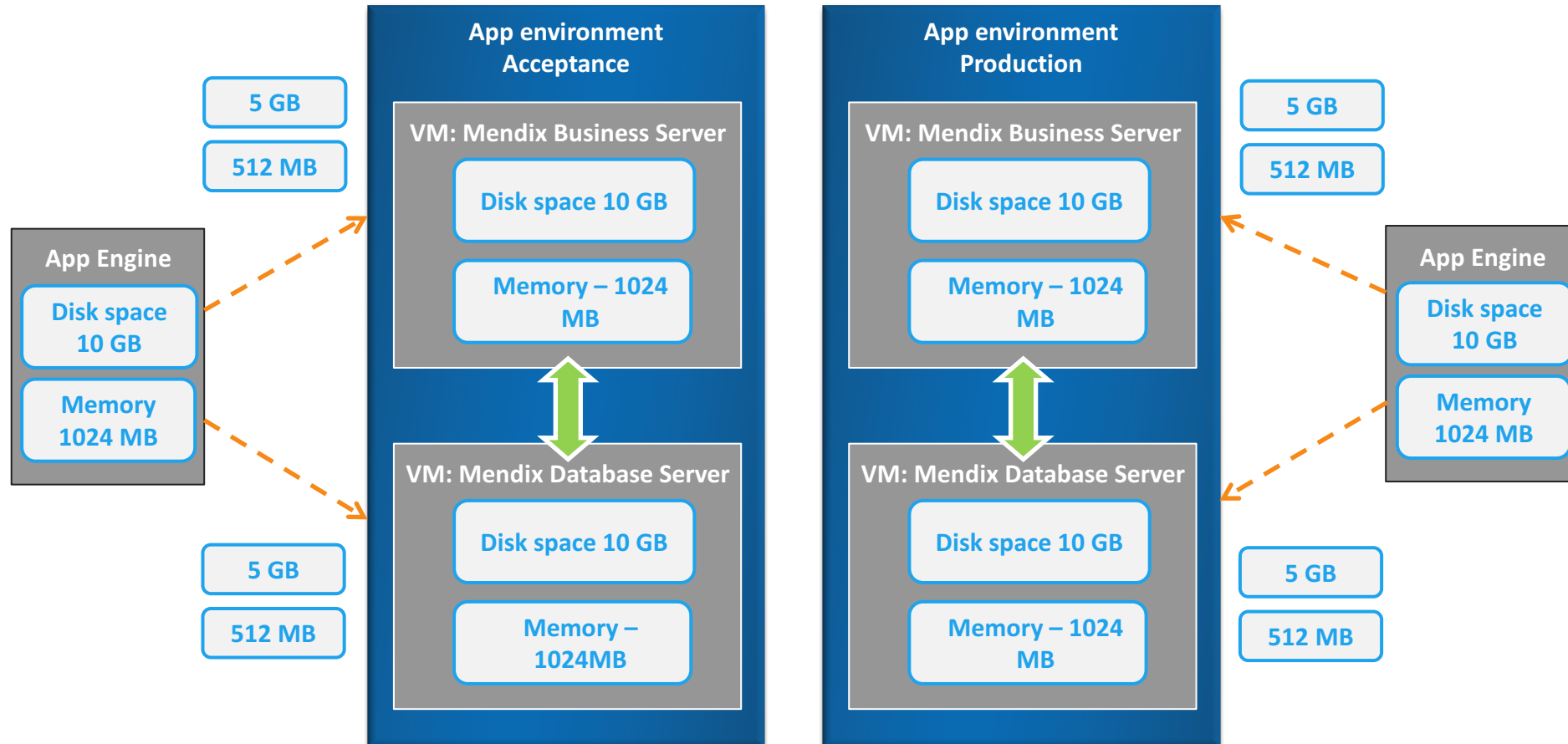
Cloud Overview – Environment sizes

Default Application Environments



Cloud Overview – App Engines

Adding an app engine, default sizing



Cloud Deployment – Versioning

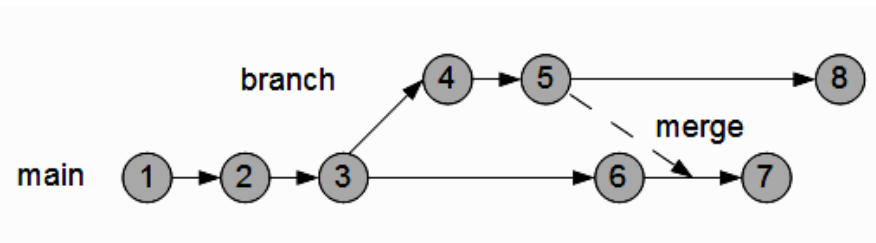
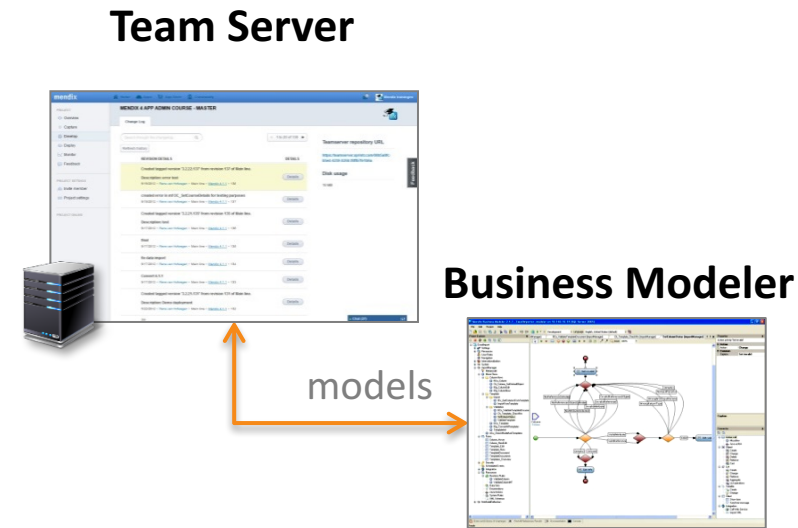
▶ Revisions

- Commit
- Numbering

▶ Branches

- Copy
- Branch from Main line
 - ▶ Great feature
 - ▶ Integration external work
- Branch from Tagged version
 - ▶ Fix in earlier release

▶ Merging



Cloud Deployment – Versioning

▶ Commit often

- Conflict reduction/prevention
- Insight of completed work
- Determine correct version
- Never commit errors

▶ Update Often

- Conflict reduction/prevention

▶ Merge often

- Direct after fix
- After feature is completed
- Changes are still known
- Conflicts are limited

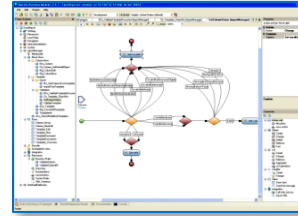
▶ Creation of branches

- Fix in earlier release
- (Big) feature (work > 1 day)
- Integration external work

Cloud Deployment – Release types

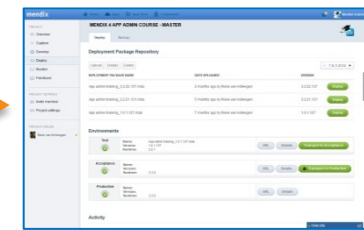
- ▶ Tagged Version
- ▶ Release types
 - Patch
 - Minor
 - Major
- ▶ Version numbering
 - Major.Minor.Patch.Revision

Business Modeler






deployment
archives

Cloud node



Deploy to the Cloud Portal

Deploy   

Source

Development line:

Revision:

Model Version

The latest tagged version of this development line is 1.0.3.16.

	Major	Minor	Patch	Revision
New version	<input type="text" value="2"/>	<input type="text" value="4"/>	<input type="text" value="1"/>	<input type="text" value="16"/>

Description:

Destination

App:

Licensee:

Cloud Deployment – Release Management

Best practices for Release procedures

- ▶ Patch *-*-1
 - Urgent & normal fixes
 - No impact on domain model /data structure
 - No impact on existing situation/no scripting (conversion) needed
- ▶ Minor *-1-*
 - No or small impact on domain model /data structure
 - Small impact on existing situation
 - App admin should be informed about conversion scripts
- ▶ Major 1-*-*
 - Might have impact on domain model /data structure
 - Prepare conversion if needed
 - All possible scenarios, including domain model changes
 - App admin should be informed about conversion scripts

Cloud Deployment – Release Management

Release procedures – Why do we need them

- ▶ Database changes
- ▶ Changes in the startup Microflow
- ▶ New scheduled event
- ▶ Broken core functionality

Cloud Deployment – Start-up failure

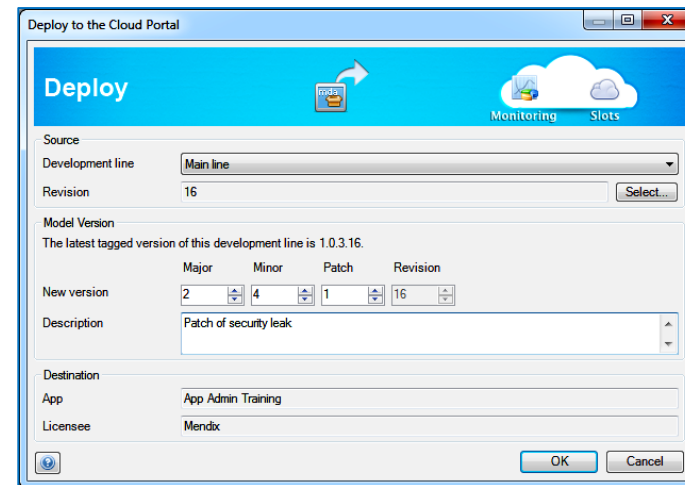
Start-up failure – Most common errors

- ▶ Startup Microflow causes an error
 - Manual start
 - Automatic restart
- ▶ Database synchronization errors
 - Data types are not compatible
 - Changes in the domain model too complicated (very rare)

Cloud Deployment – MDA

The modeler initiates the creation of the deployment archive (MDA)

- Based upon revision of the team server
- Adds a tag to the revision with version number
- The MDA file contains
 - ▶ The model
 - ▶ Java actions & additional libraries
 - ▶ Theme
 - ▶ Custom widgets
 - ▶ Meta information
 - App ID, App version, Mx version
- MDA creation
 - ▶ Mx 4 & earlier: MDA is created by the modeler
 - ▶ Mx 5 & up: MDA is created by the online build server
- The MDA is transported to the MDA Repository of the assigned cloud node



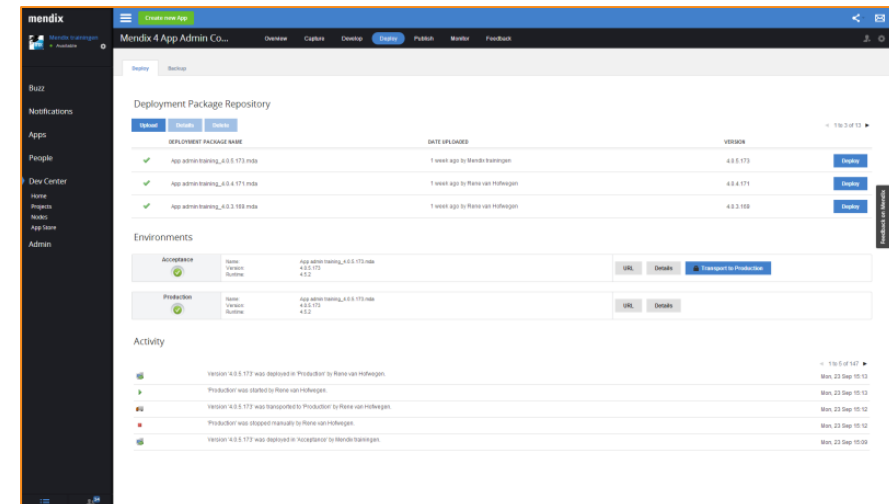
Cloud Deployment – DTAP & transports

▶ DTAP stands for

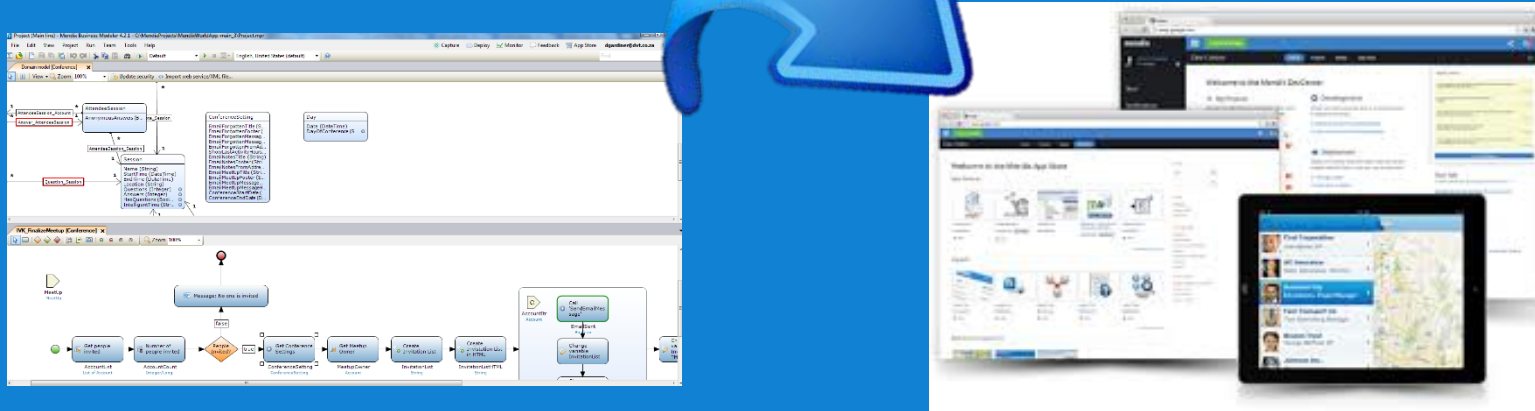
- **Development** => laptop / local => developer
- **Test (optional)** => test environment => dev. team
- **Acceptance** => test environment => customer
- **Production** => the actual application => end-user

▶ Environments are identical

- (Test,) Acceptance & Production



Cloud Deployment – Demo



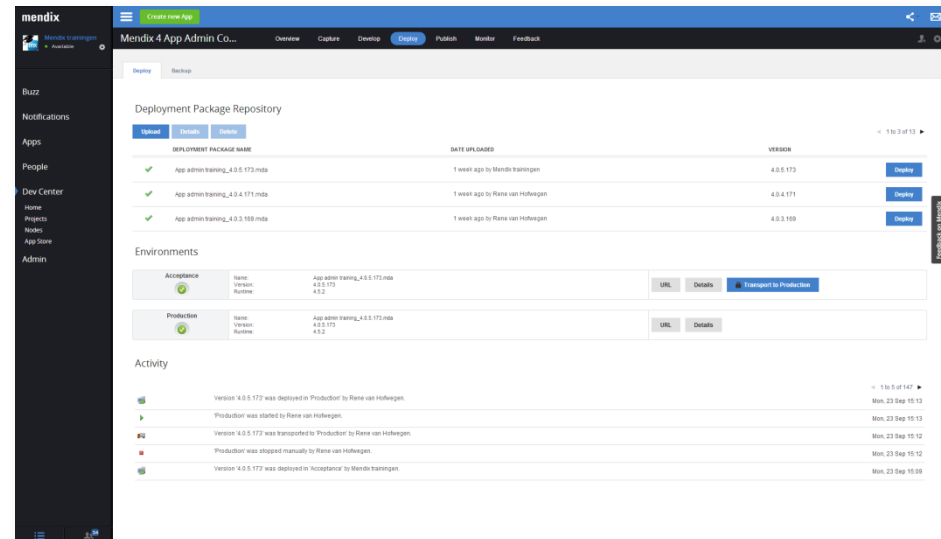


Administration

Mendix Cloud

Cloud Administration – Management

- ▶ Dashboard for instant overview
- ▶ Configuration of cloud nodes
- ▶ (T)AP management
- ▶ Transport & deployment of applications
- ▶ Security & auditing
- ▶ Backups
- ▶ Monitoring
- ▶ Alerting & logging





Configuration

Mendix Cloud

Cloud Configuration – Mendix Cloud Node

Cloud node

- Initiation by Mendix
- Based on license / order
- Mode (test - production) = app environment
- Resources (RAM, HD)
- License keys

Environment Settings

- Administrator password
- Model Options
- Network
- LogLevels
- Advanced

Environments			
Test	Name: App admin training_1.0.1.127.mda Version: 1.0.1.127 Runtime: 3.2.1	URL Details	Transport to Acceptance
Acceptance	Name: Version: 3.3.0 Runtime:	URL Details	Transport to Production
Production	Name: Version: 3.3.0 Runtime:	URL Details	



Security

Mendix Cloud

Cloud Security – Project vs Node

- ▶ Project security != Node security
 - Project security is project related access
 - ▶ Stories, documents, team server, feedback
 - Node security is cloud related access
 - ▶ Deployment, monitoring, back up

The screenshot shows the Mendix Admin Console interface for 'Mendix 4 App Admin Co...'. The 'Project Security' tab is active, displaying a search bar, 'Add member', 'Role settings', and 'Change log' buttons. Below is a table of users:

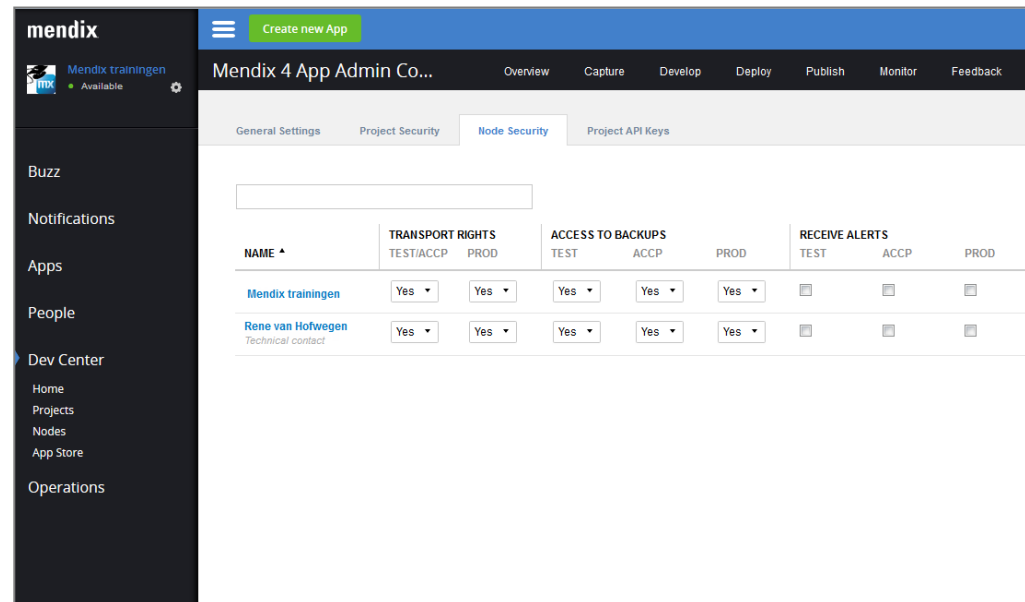
NAME ^	LAST ONLINE	ROLE
Rene van Hofwegen	01 Oct 2013 10:51	SCRUM Master
Mendix trainingen	01 Oct 2013 10:51	Business Engineer

The screenshot shows the Mendix Admin Console interface for 'Mendix 4 App Admin Co...'. The 'Node Security' tab is active, displaying a search bar and a table of permissions:

NAME ^	TRANSPORT RIGHTS		ACCESS TO BACKUPS			RECEIVE ALERTS		
	TEST	ACCP	TEST	ACCP	PROD	TEST	ACCP	PROD
Mendix trainingen	Yes	Yes	Yes	Yes	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rene van Hofwegen <small>Technical contact</small>	Yes	Yes	Yes	Yes	Yes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Cloud Security – App specific

- ▶ Each App has a technical contact
 - Specified in the (sales) contract with Mendix
 - Is the person to select the Mendix project
 - Is the only person who can set Node privileges
 - Cannot be deleted



The screenshot displays the Mendix Admin console interface. The left sidebar shows navigation options: Buzz, Notifications, Apps, People, Dev Center (selected), Home, Projects, Nodes, App Store, and Operations. The main content area is titled 'Mendix 4 App Admin Co...' and includes a 'Create new App' button. Below the title are tabs for 'General Settings', 'Project Security', 'Node Security' (active), and 'Project API Keys'. A search bar is present above a table of users. The table lists users and their permissions across different environments (TEST, ACCP, PROD) for various rights (TRANSPORT RIGHTS, ACCESS TO BACKUPS, RECEIVE ALERTS).

NAME ▲	TRANSPORT RIGHTS		ACCESS TO BACKUPS			RECEIVE ALERTS		
	TEST/ACCP	PROD	TEST	ACCP	PROD	TEST	ACCP	PROD
Mendix trainingen	Yes ▾	Yes ▾	Yes ▾	Yes ▾	Yes ▾	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rene van Hofwegen <small>Technical contact</small>	Yes ▾	Yes ▾	Yes ▾	Yes ▾	Yes ▾	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Cloud Security – Logging & auditing

- ▶ Logging activities
 - Cloud app actions
 - Logged activities
 - ▶ Uploading MDA
 - ▶ Transportations
 - ▶ Starts & stops of applications
 - ▶ Creating & restoring backups
 - ▶ Changes in team members
 - For auditing purposes
 - Stored for 1 year

Cloud Security – Server

Java containment - custom Java actions

- No IO access , exceptions:
 - ▶ Provided by the MBS a.k.a. the Core.API
 - ▶ Write actions in temp directory permission
 - ▶ Read actions in temp & resources directory
- No system properties, etc

Production mode

- Strong administrator password is required
- Blocks accounts for 10 min. after 3 failed logins
- Logs all failed logins
- Production security must be set in the project
- Updates require
 - ▶ An additional authentication
 - ▶ Approval of customer for the acceptance environment



Use the emulate cloud security option



Monitoring

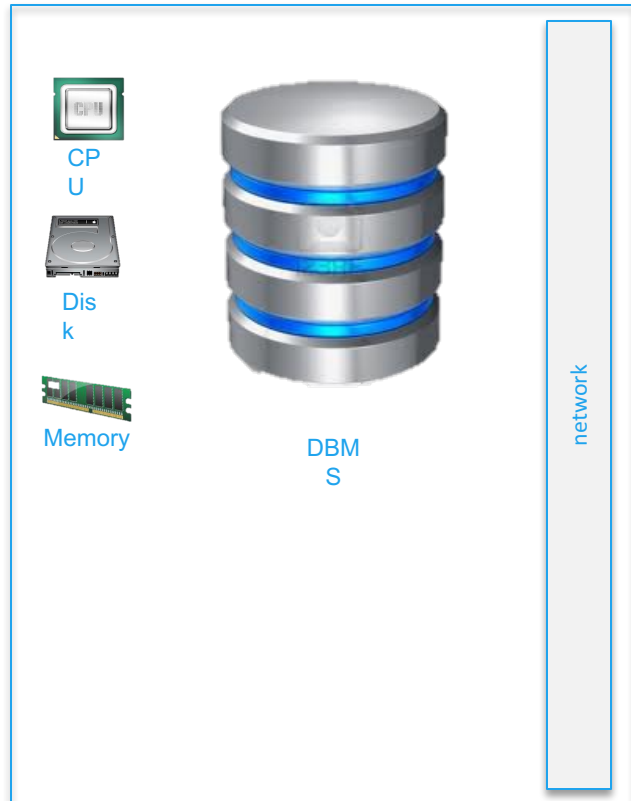
Mendix Cloud

Cloud Monitoring – Recommendations

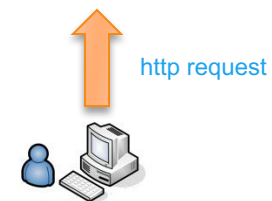
- ▶ Monitoring per environment(server) of:
 - Disk
 - Memory
 - CPU
 - Webserver
 - Runtime
 - Database
- ▶ Alerting mechanism when
 - Critical errors occur
 - Failures might arise
- ▶ Storage of log
 - 2MB per file
 - Last 10 files

Cloud Monitoring – Overview

Database Server



Application Server



Cloud Monitoring – Statistics

▶ Mendix Runtime

- Amount of handled external requests
- Object Cache
- User accounts and login sessions
- JVM Object Heap
- JVM Process Memory Usage
- Threadpool for handling external requests
- Total amount of threads in the JVM process

▶ Database Statistics

- Database transactions and mutations
- Database table vs. index size

▶ Application Node Statistics

- Application node CPU usage
- Application node disk IO/s
- **Application node load**
- **Application node operating system memory**
- **Application node disk latency**

Cloud Monitoring – Statistics

▶ Application Node Statistics

- Application node disk throughput
- Application node disk usage (in bytes)
- Application node disk usage in %
- Application node disk utilization

▶ Database Node Statistics

- Database node CPU usage
- Database node disk IO/s
- Database node load
- Database node operating system memory
- Database node disk latency
- Database node disk throughput

Cloud Monitoring – Statistics

- ▶ Database Node Statistics
 - Database node disk throughput
 - Database node disk usage in %
 - Database node disk utilization
 - Amount of database connections



Backup management

Mendix Cloud

Cloud Backup – Automatic backup

- ▶ Only on production environments
- ▶ Every night (between 0:00 – 6:00)
- ▶ Full copy
 - Database
 - Files
- ▶ Meta data (stored in the database)
- ▶ Stored for
 - Younger than 2 weeks: all
 - Younger than 1 month: On the 1st, 8th, 15th, 22nd
 - Younger than 1 year: 1st of every month
 - Older than 1 year: 1st of January

Cloud Backup – Manual backup

- ▶ Available for every environment
- ▶ Thru cloud app management
- ▶ Application continues to run
- ▶ Full copy
 - Database
 - Files
- ▶ Meta data stored in the database
- ▶ Stored indefinitely
- ▶ Three backups per project!!

Cloud Backup – Restoring backup

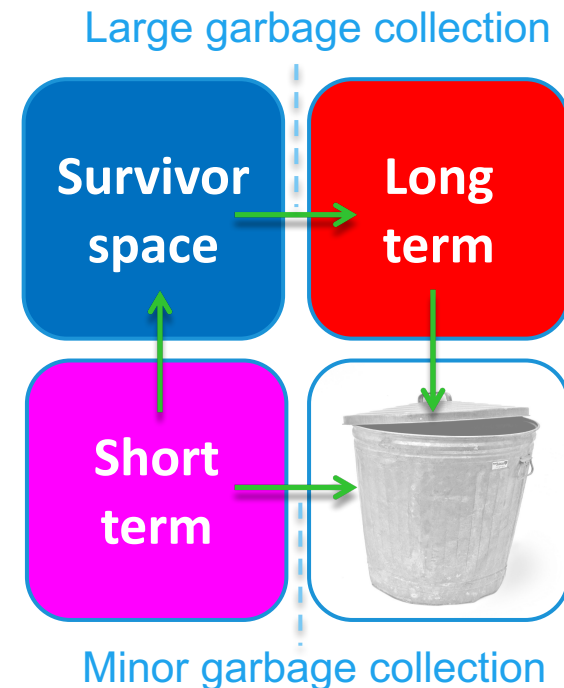
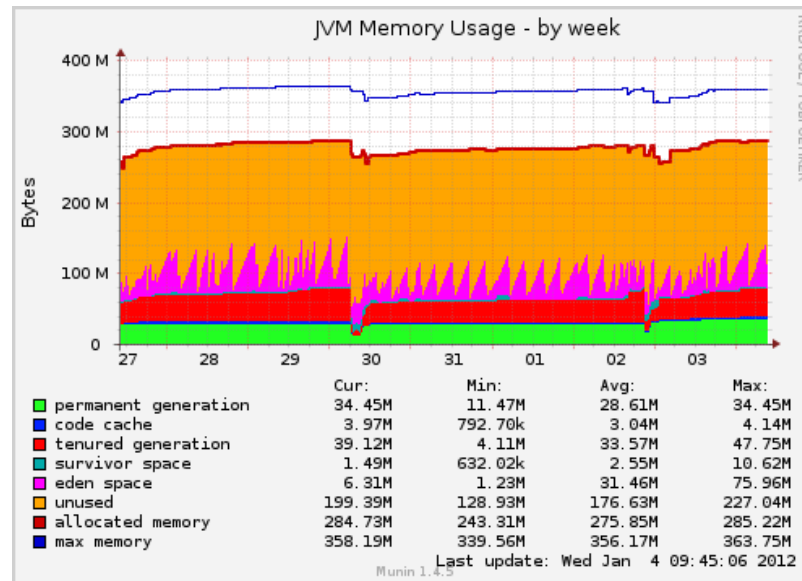
- ▶ Available for every environment
- ▶ Thru cloud app management
- ▶ Application has to be stopped
- ▶ Restore of:
 - Database backup
 - Files backup
 - Related MDA file



Analyzing Graphs

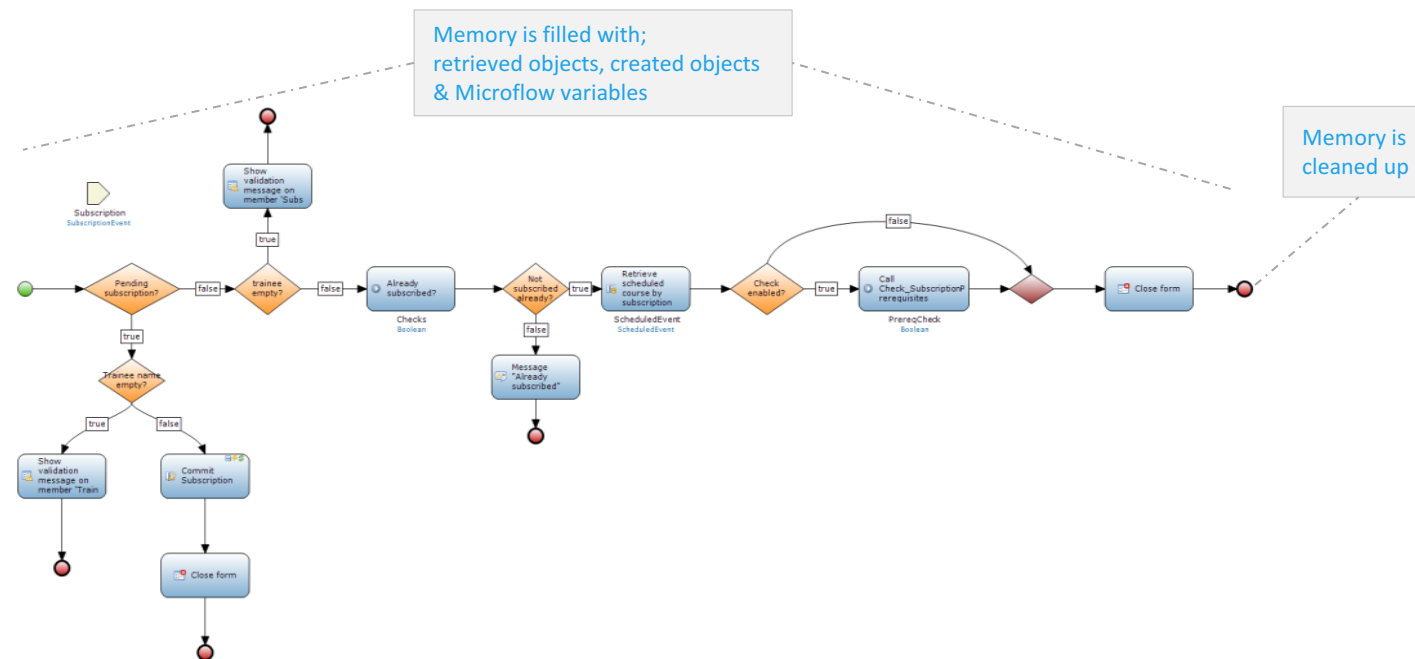
Cloud Monitoring – JVM Memory

- ▶ Memory of Mendix Business server
- ▶ How does the Java heap space work?
- ▶ Thresholds (simplified)
 - 33% short term memory cleanup (minor GC)
 - 60% long term memory cleanup (major GC)



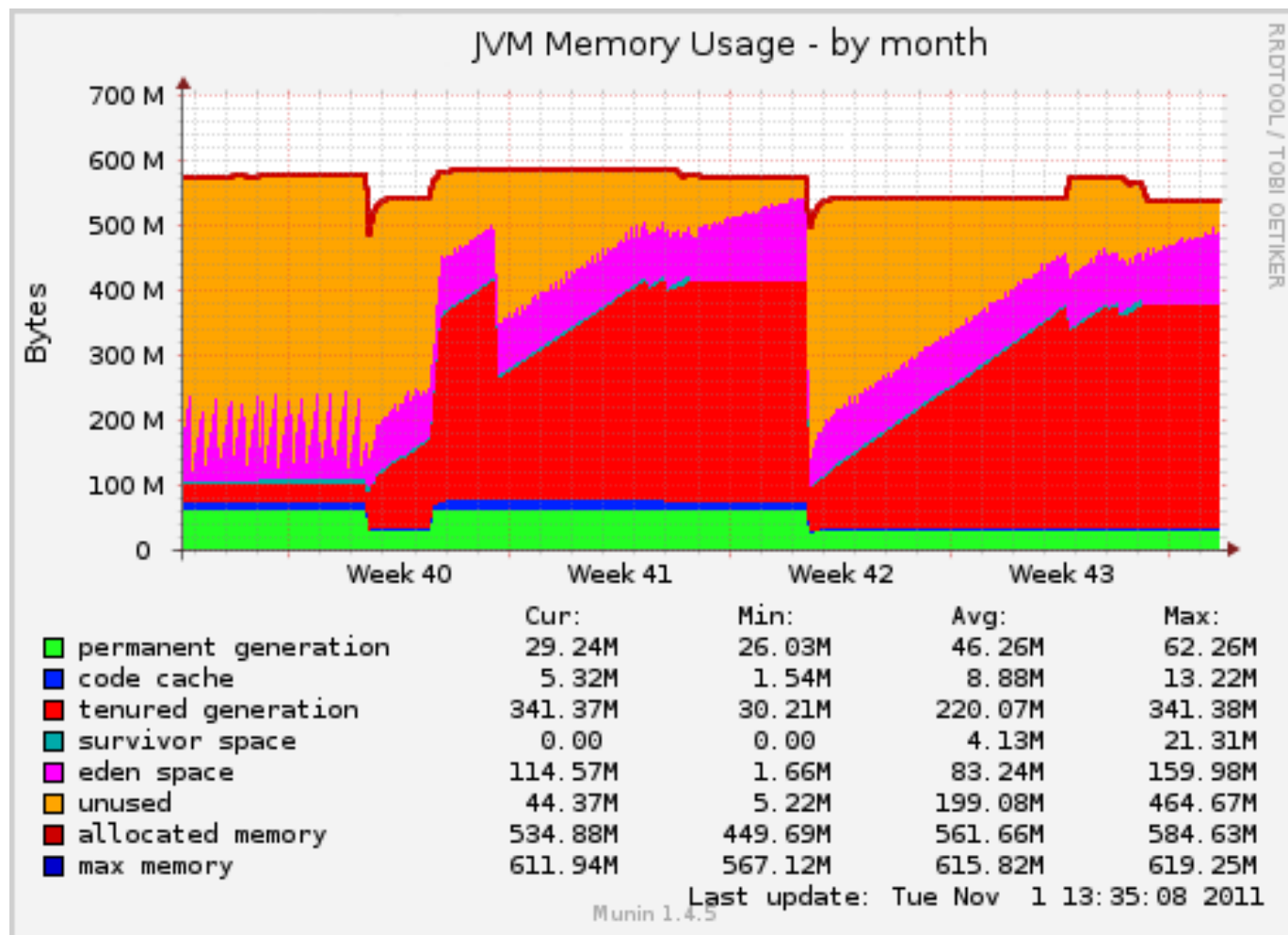
Cloud Monitoring – Memory Management

- ▶ Microflows will clean up after execution
- ▶ Used memory will be released for GC
- ▶ No memory leak occurs
- ▶ Custom Java (libraries) won't do this by default!



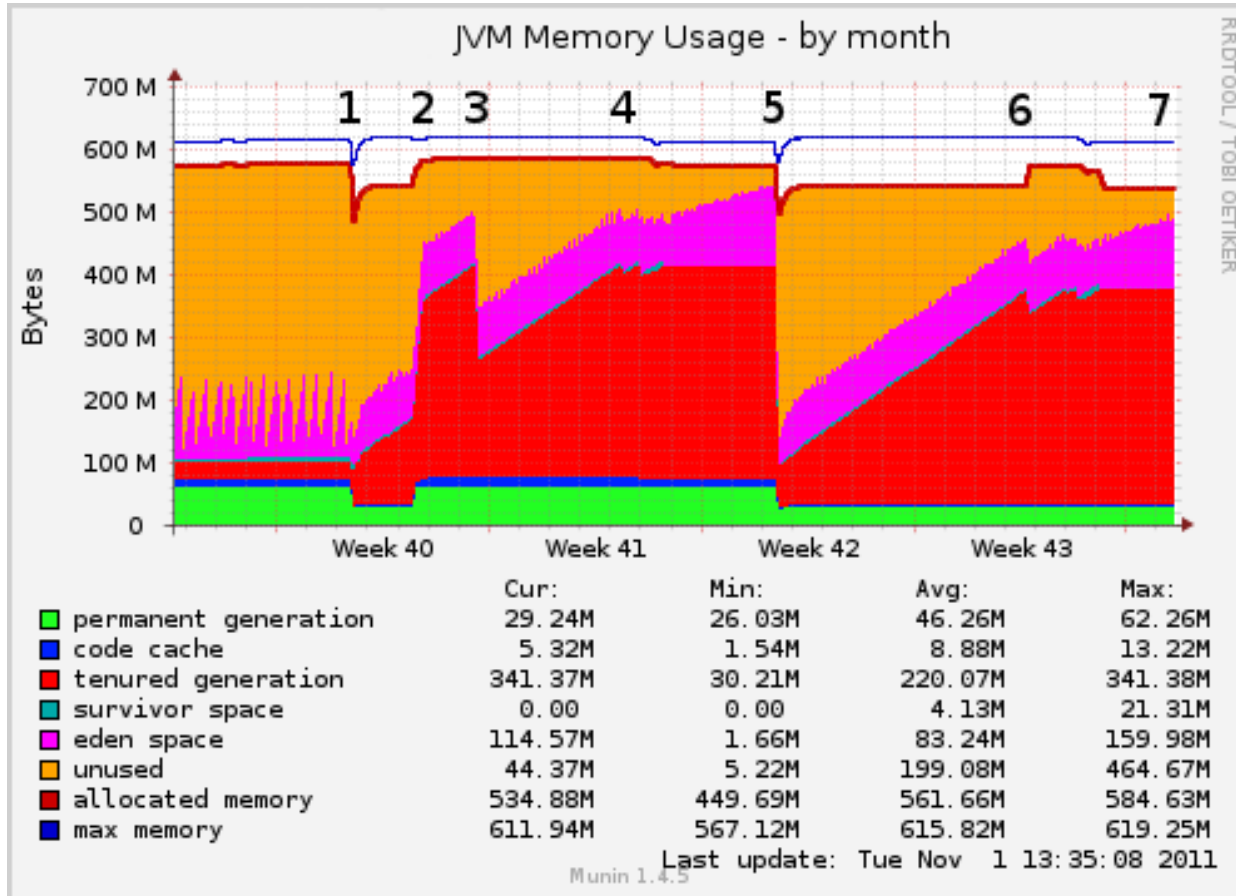
Analyzing graphs – Overview

- ▶ Analyzing = trend searching = looking for deviations
- ▶ Number of users should have an affect on
 - Requests
 - Database commands
 - Memory (<1 mb per concurrent user)
 - CPU
- ▶ Deviations (over time) can mean
 - 'heavy' microflows
 - Growing database
- ▶ The more (web service) users using the application, the more requests you can expect to the business server, which has an effect on the JVM Memory and CPU Usage.



Question: What happens within this graph & application?

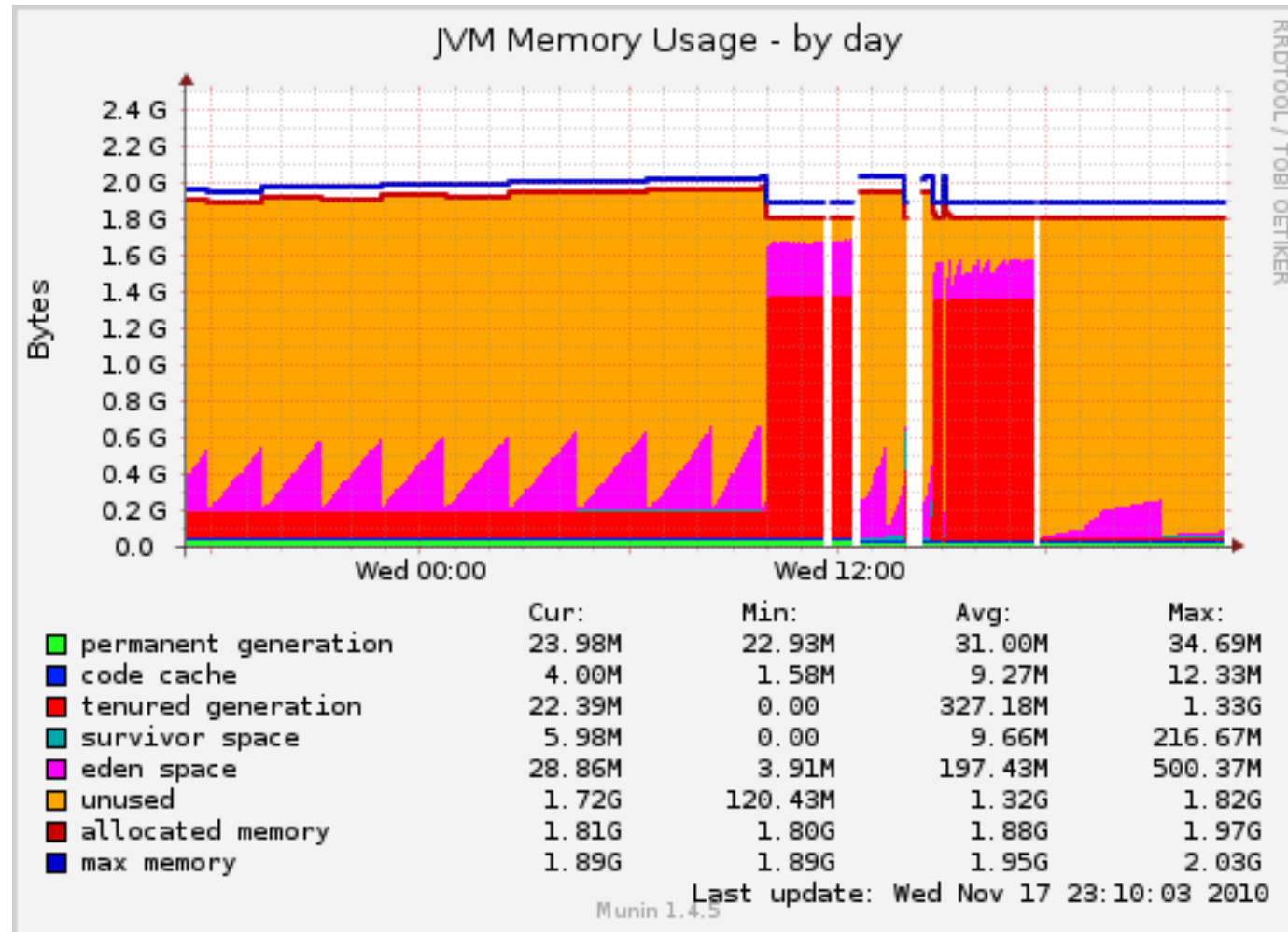
Analyzing graphs – Case 1



► **Question:** What happens within this graph & application?

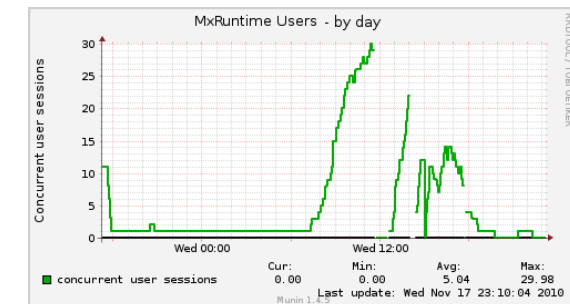
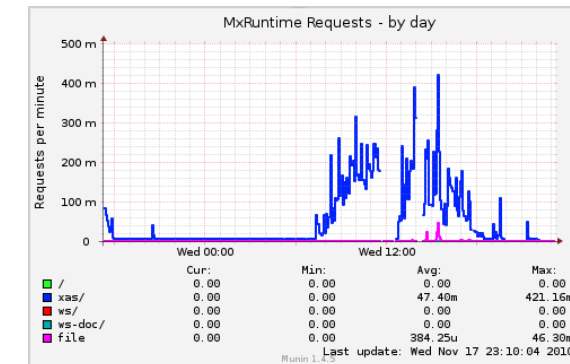
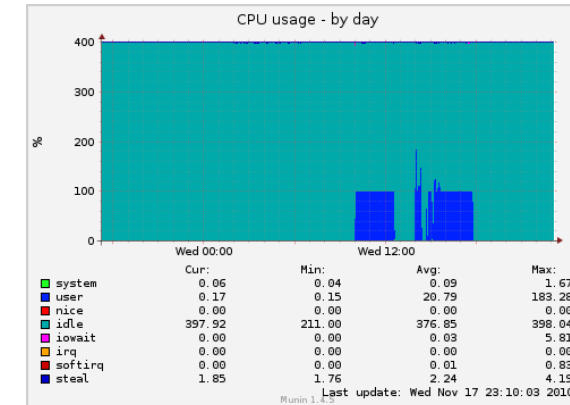
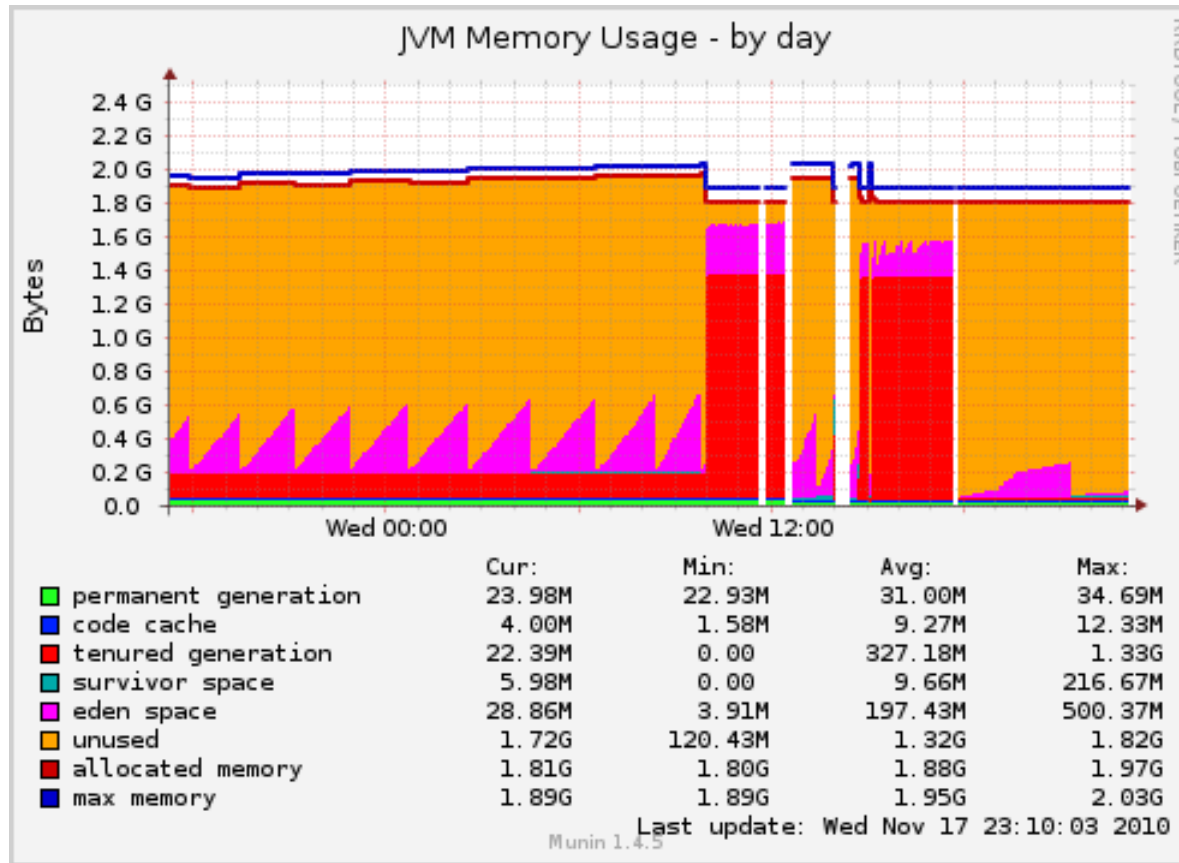
1. Objects are held captive, GC cannot free memory
2. Objects are held captive by new process
3. GC try to free memory from tenured generation
4. Tenured generation heap space keeps growing
5. The application crashes, given error:
java.lang.OutOfMemoryError: GC overhead limit exceeded
6. Tenured generation is filled up again
7. Out of memory will happen again

Analyzing graphs – Case 2



Question: What happens within this graph & application?

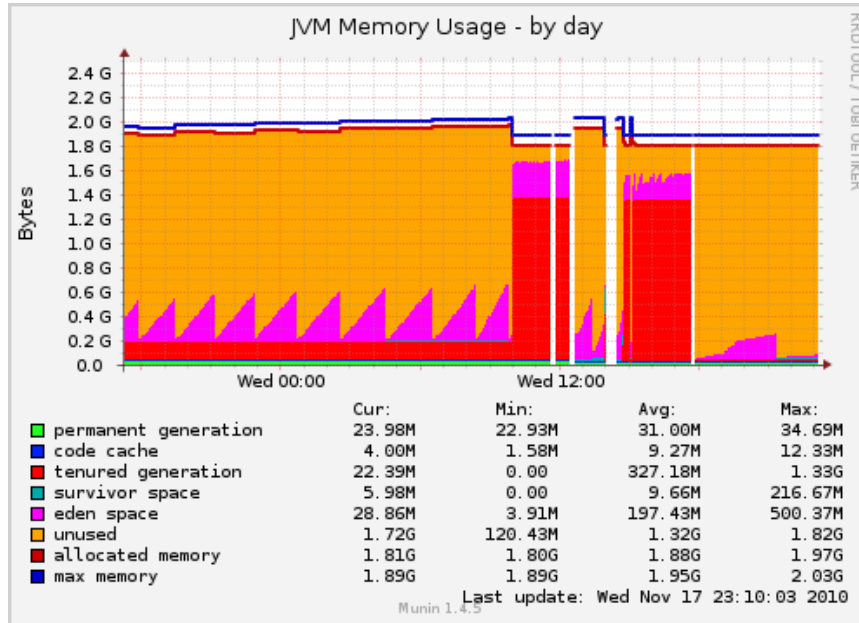
Analyzing graphs – Case 2



Question:

Which kind of information can be distilled out of the different graphs?

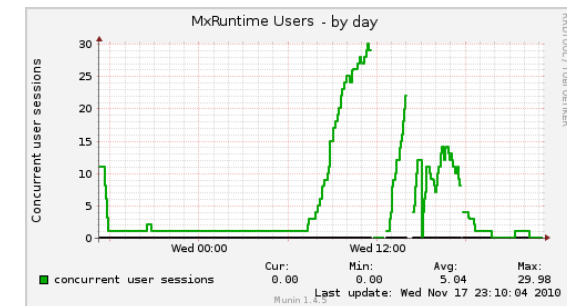
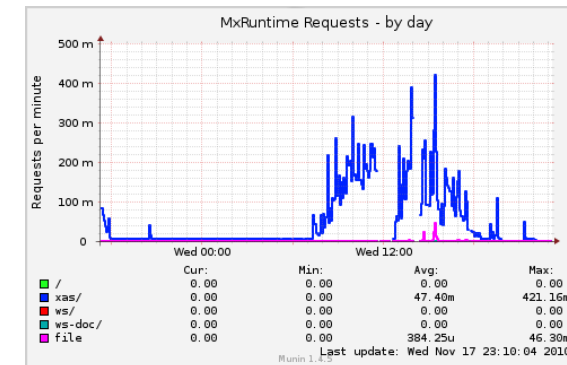
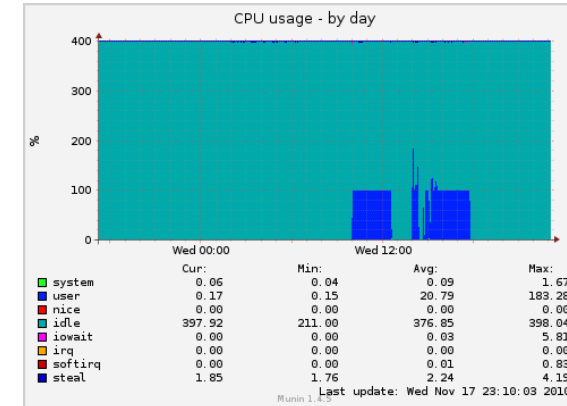
Analyzing graphs – Case 2



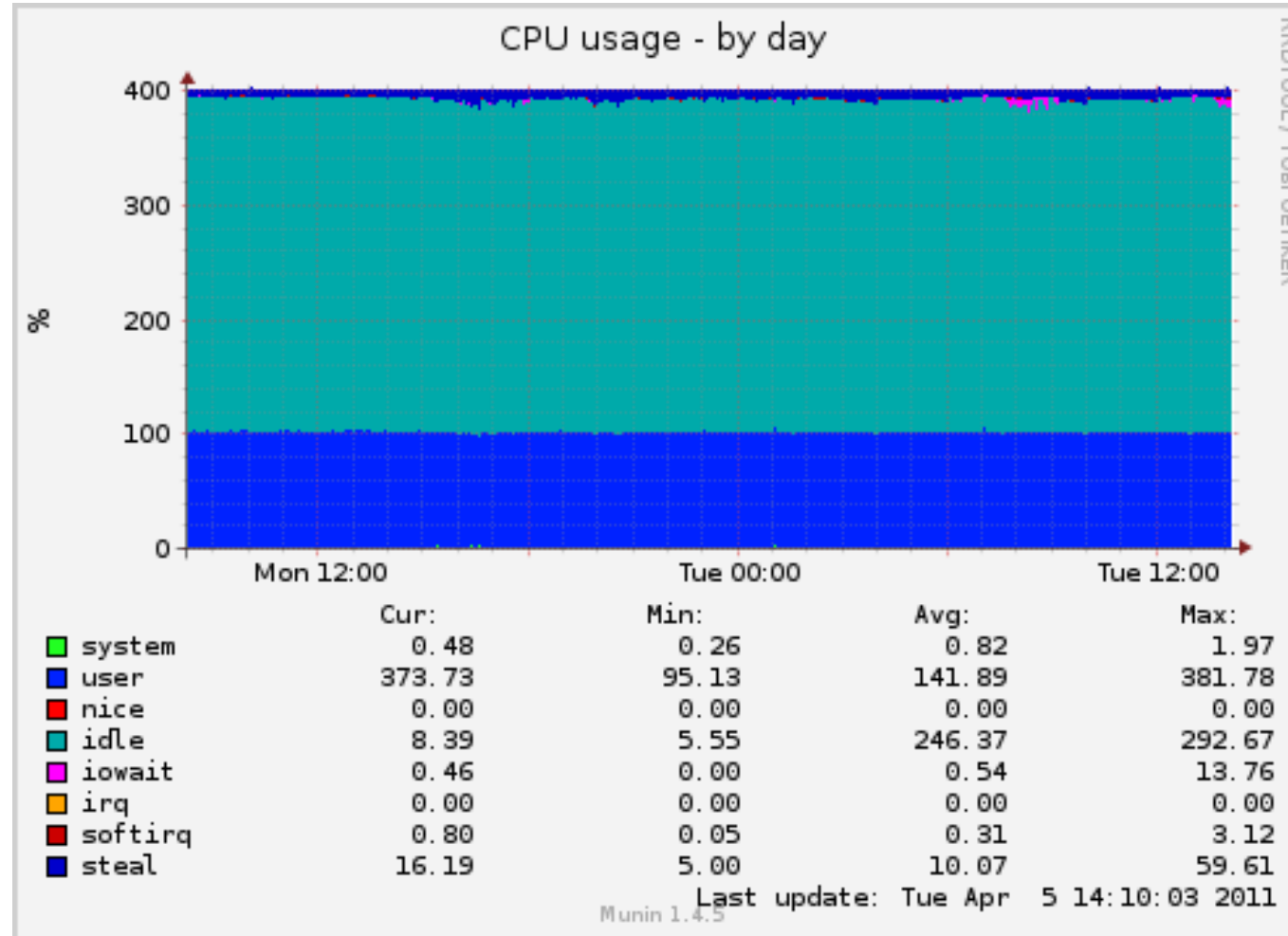
Question:

Which kind of information can be distilled out of the different graphs?

1. Due to unusual action creating a pile of objects, tenured generation grown extremely.
2. The application crashes, given error;
java.lang.OutOfMemoryError: Java heap space

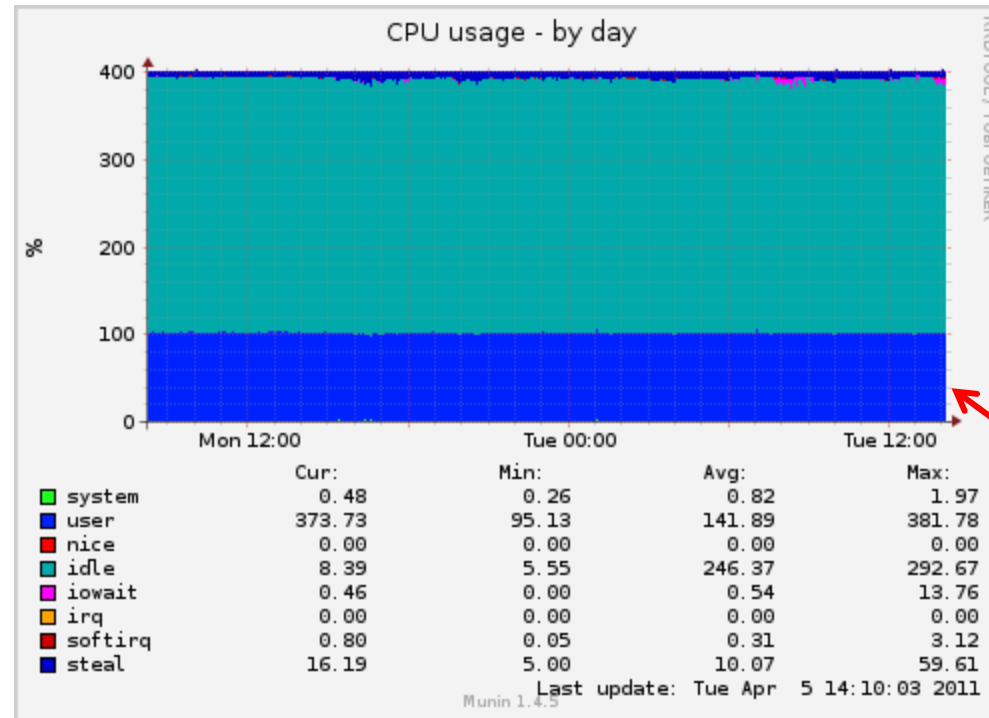


Analyzing graphs – Case 3



Question: What happens within this graph & application?

Analyzing graphs – Case 3



Constant
CPU usage

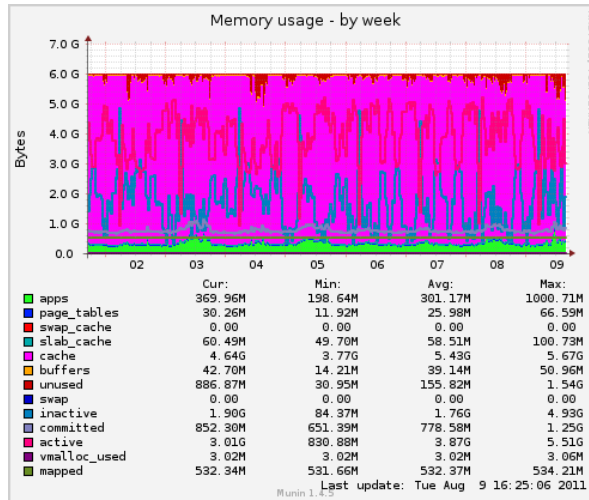
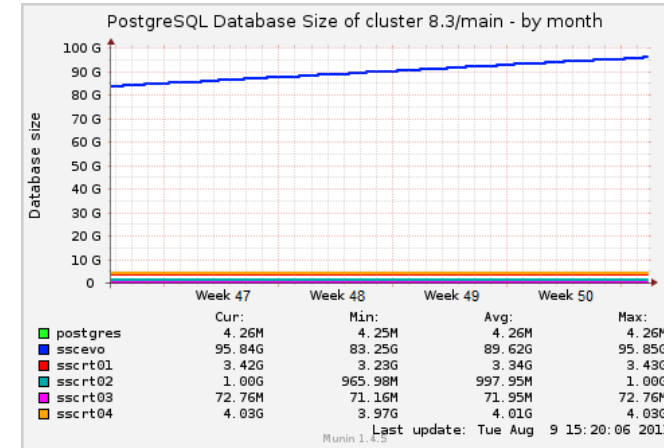
Question: What happens within this graph & application?

1. One microflow is running; Since only one core is used
2. It is a heavy Microflow; core is used at 100%
3. Might be a scheduled event, triggered multiple times and queuing

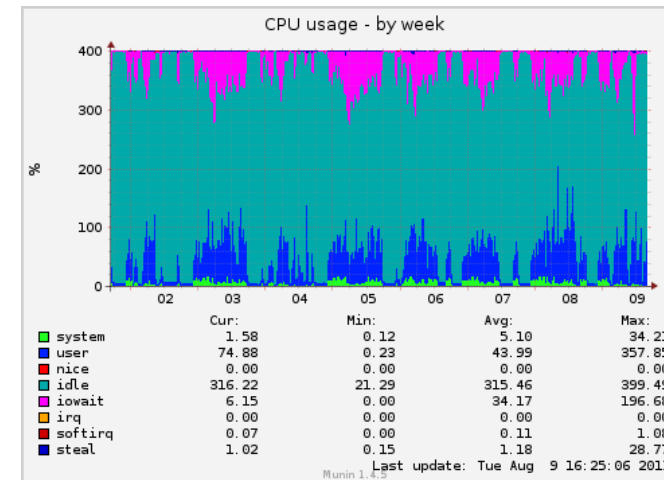
Analyzing graphs – Case 4

Data base is growing with 10 Gb in 4 weeks.
This indicates creation of a lot of objects.

- Due to heavy application with useful data
- Generation of i.e. object for import, without proper cleaning



Memory usage becomes a problem.
Data base contains more data than fits in the business server memory.



The database server will be used for temporary memory. This will have a negative influence on the database performance

Analyzing graphs – Best practice

- ▶ Monitoring means a regular look at you monitoring graphs
- ▶ Search for trends
- ▶ Inform your PO and/or Development team when noting trends which MIGHT cause future problems (feedback item)
 - What might happen?
 - What is the consequence?
 - What might be a solution?



Logging

Logging – Overview

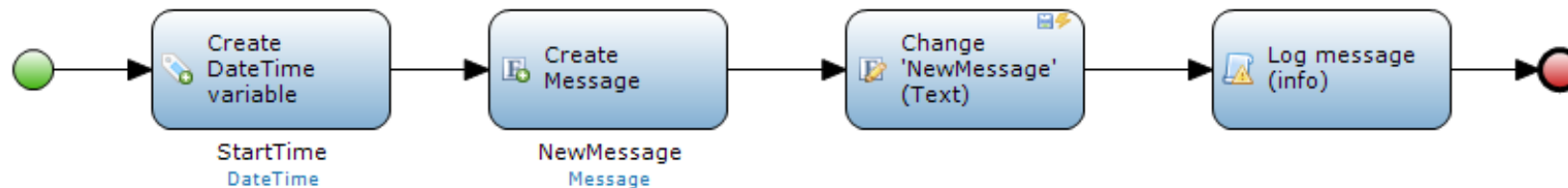
- ▶ Log of the MBS is stored in log files
- ▶ Always check the log file after a failed startup
- ▶ Not always necessary to find the actual root cause
- ▶ Recommended settings:
 - Archive Log files > 2 MB
 - Store the last 10 Log files

Logging – Common messages

- ▶ Errors in custom Java actions
- ▶ Java heap spaces
- ▶ Errors in microflows

Logging – Custom logging

- ▶ Log action in Microflow
- ▶ Log levels
- ▶ Usage
 - Log process critical fault with additional app/model information
 - Long running processes
 - ▶ Batches
 - ▶ Web services
 - ▶ Scheduled events



Logging – Best practices

- ▶ Trace
 - Used for development long term
- ▶ Debug
 - Used for development short term
- ▶ Info
 - Logging of important business processes
- ▶ Warning
 - Logging of incident that need investigation
- ▶ Error
 - Logging of an incident which stops an critical use case
- ▶ Critical
 - Logging of incident which causes a sudden crash of the application

Logging – stacktraces examples ^{1/6}

Occurrence

ERROR - M2EE: (1/1) java.lang.OutOfMemoryError: Java heap space

Possible cause

- ▶ Export to excel of an too large data set

Solution

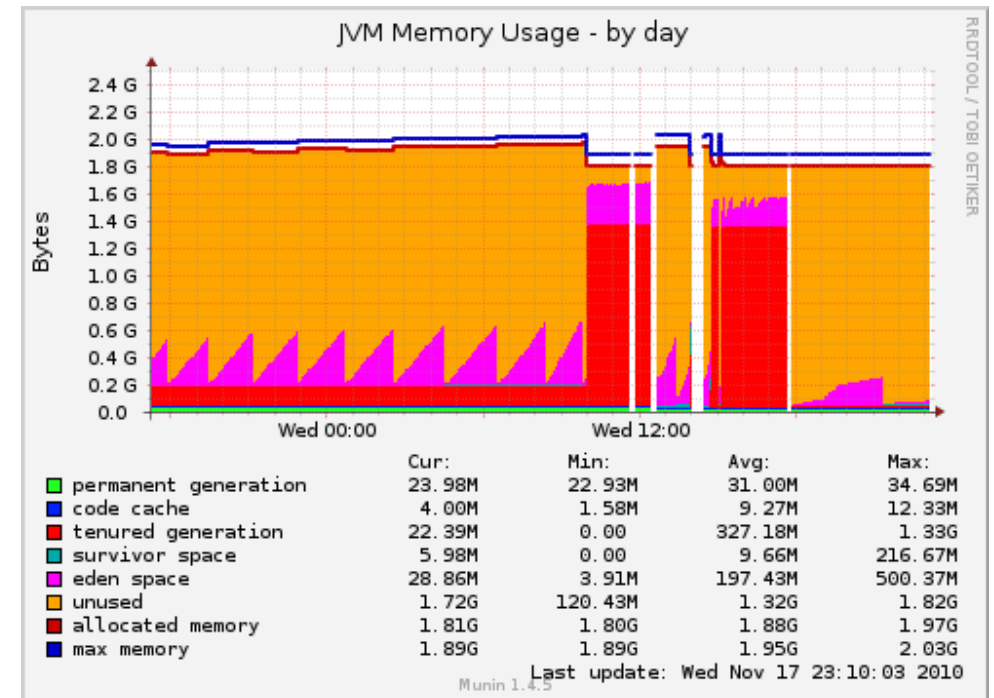
App admin

- ▶ Identify cause by searching for logs of excel exports
- ▶ Inform Developer about cause

Developer

- ▶ Change export to excel to a export to CSV

Reason: a data export to CSV is streaming, while export to excel isn't



Logging – stacktraces examples 2/6

Occurrence

ERROR - M2EE: (1/1) java.lang.OutOfMemoryError: Java heap space

Possible cause

- ▶ Processing a large set of data in a microflow

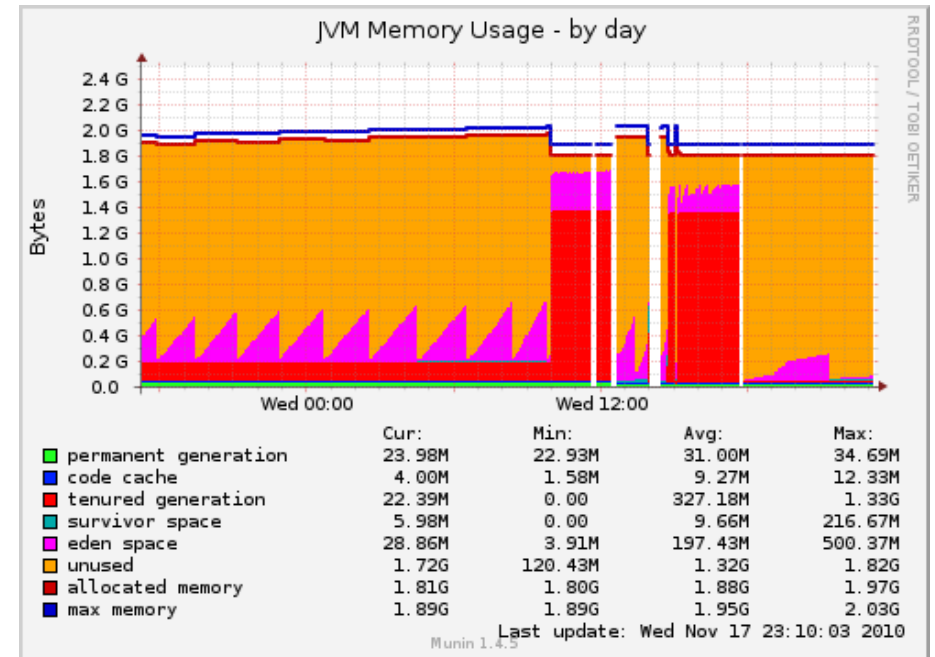
Solution

App admin

- ▶ Identify cause by searching for logs of large microflows
- ▶ Inform Developer with found logs
- ▶ Request Developer for adding logging activity in large microflows
- ▶ Request for more (temporary) memory

Developer

- ▶ Convert actions with batch operations
- ▶ Add logging activities on large microflows



Logging – stacktraces examples 3/6

Occurrence

ERROR - M2EE: (1/1) java.lang.OutOfMemoryError: Java heap space

Possible cause

- ▶ Combination of multiple synchronal heavy data related actions by multiple users

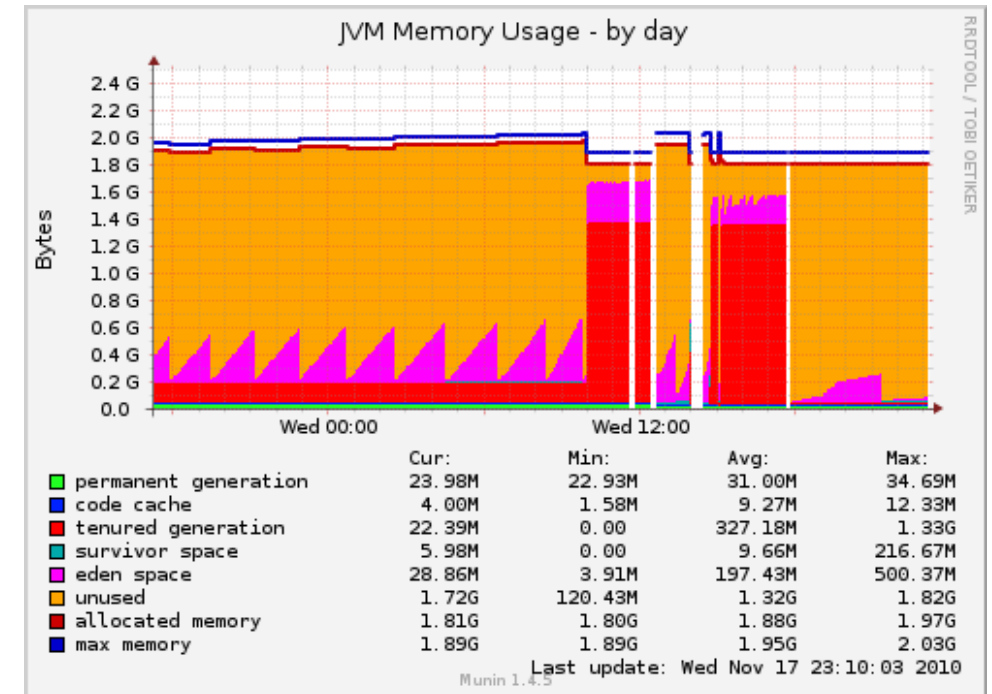
Solution

App admin

- ▶ Identify cause by searching for logs of large microflows
- ▶ Inform Developer with found logs
- ▶ Request Developer for adding logging activity in large microflows
- ▶ Request for more (temporary) memory

Developer

- ▶ Convert actions with batch operations
- ▶ Add logging activities on large microflows
- ▶ Implement planner module (+ Back end Business server)



Logging – stacktraces examples 4/6

Occurrence

ERROR - Connector: java.lang.OutOfMemoryError: GC overhead limit exceeded

Possible cause

- ▶ Garbage collector (Tenured Generation) is filled up due to Memory leak caused by custom Java action(s)
- ▶ OR external library which doesn't clean up the memory after finalization of action
- ▶ Occurrence rarely : Not a Mendix issue !

Solution

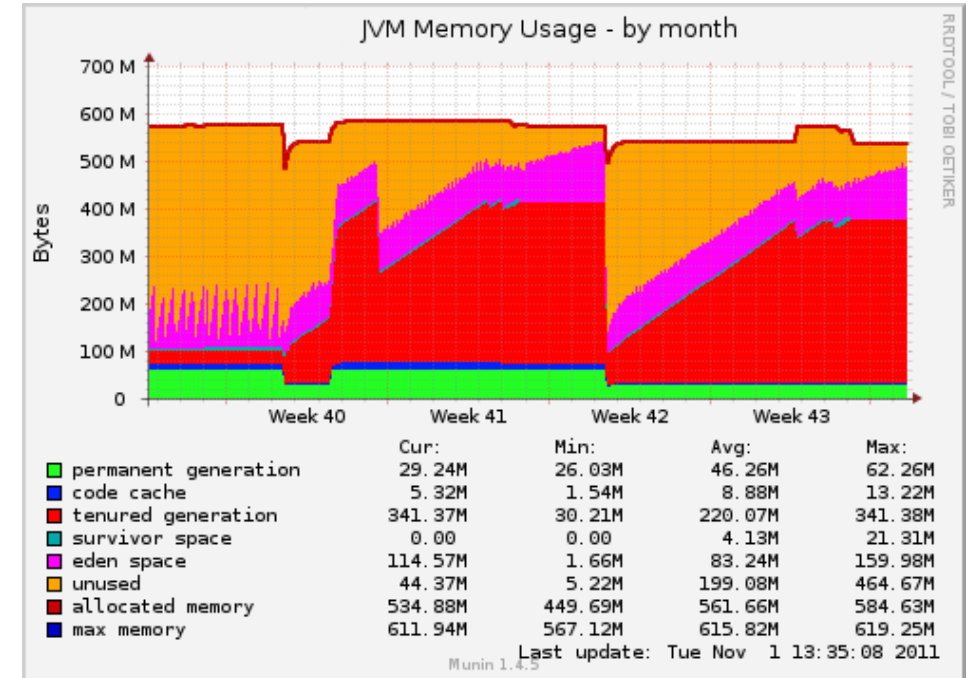


App admin

- ▶ Memory dump + analyze with eclipse (hard to do)
- ▶ Inform Developer about findings
- ▶ Temporary quick fix: if finding solution takes to much time; Scheduled restart

Developer

- ▶ Determine reason of generation of “Garbage”
- ▶ Adjust (Custom Java) so that they will clean up their own temporary objects



Logging – stacktraces examples 5/6

Occurrence

ERROR - Connector: java.lang.OutOfMemoryError: GC overhead limit exceeded

Possible cause

- ▶ Interval of a scheduled event is significant shorter then execution time of Microflow

Possible Result

New triggered scheduled events will be delayed

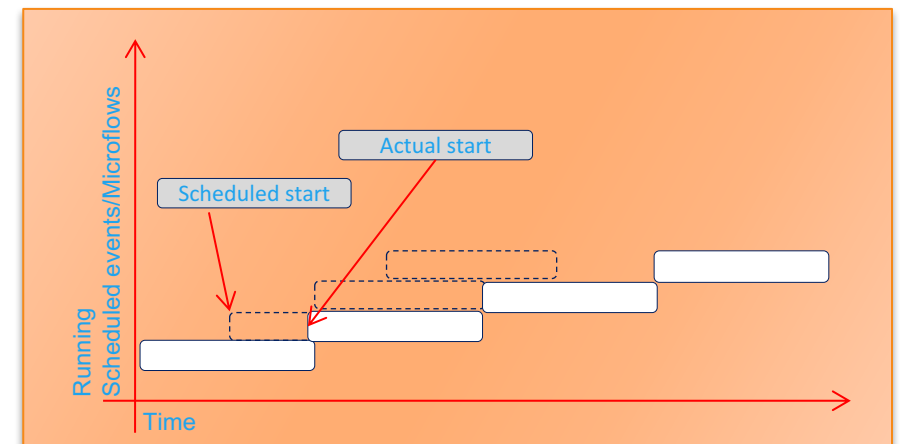
Solution

App admin

- ▶ Search log for scheduled event logs where scheduled events starts before previous has been ended.
- ▶ Inform developer

Developer

- ▶ Adjust execution cycle of scheduled events



Logging – stacktraces examples 6/6

Occurrence

com.mendix.core.CoreException: Exception occurred in action 'Microflow [Module.Microflow_Name]', all database changes executed by this action were rolled back

Cause

- ▶ A microflow caused an error
- ▶ Modeling development error

Solution



App admin

- ▶ Investigate log file asap
- ▶ Try to determine the (end user) scenario when the error occurred
- ▶ Inform developer about error with details/stacktrace

Developer

- ▶ Investigate related microflow
- ▶ Adjust behavior accordingly



Alerting

Alerting – Overview

- ▶ Status overview (Dashboard)
 - Overview app environment status
 - High-level, indicates presence of possible malfunction
- ▶ Email alerts


Alerting – Recommended settings

- ▶ Alerts (application status)
 - Warning / Critical Alerts
 - Application unexpected down
 - Critical messages in log
 - Failed health check
 - CPU load > 90-100%
- ▶ Store for 1 year

Alerting – Custom alerts

- ▶ By adding a 'Log message' with level 'Critical'
- ▶ Add a health check Microflow to the Model
 - Empty string means every thing is OK
 - Returns a string with the error message

Alerting – Solving critical alerts

- ▶ Restart
- ▶ Search end of log file for stack trace
- ▶ Common critical causes
 - Java Heap Space
 - ▶ Excel exports (search for logs ??)
 - ▶ Batch operations in 1 microflow (often scheduled events)
 - ▶ Write log  for these operations (in the model)
- ▶ Temporarily increase memory



Mendix Support

Service Level specifics - priority

Impact:

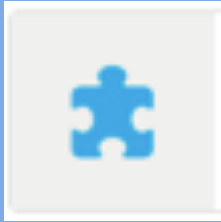
- ▶ High: A high priority production issue with a high impact on the customer's business, impacting (almost) all users
- ▶ Medium: A production issue with intermediate impact on the customer's business, impacting a group of users
- ▶ Low: A trivial production issue with no impact on the customer's business.

Urgency:

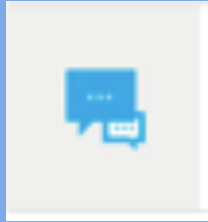
- ▶ High: The operational functionality is severely disrupted.
- ▶ Medium: The operational functionality is limited disrupted
- ▶ Low: The operational functionality is hardly disrupted.

	High	Medium	Low
High	Critical	High	Medium
Medium	High	Medium	Low
Low	Medium	Low	Low

How to contact us



Community Forum
forum.mendix.com



Support Portal
support.mendix.com



Email
Support@mendix.com



Phone
US 1 617 939-9638
UK +44 3308 280000
NL +31 10 478 8848
SA +27 11 550 2419

[//developers.mendix.com/support/](http://developers.mendix.com/support/)

Important links : forum

- ▶ Forum : forum.mendix.com
- ▶ Connect with other developers : ask and answer questions
- ▶ Suggest new features and vote

The screenshot displays the Mendix Forum interface. At the top, there is a navigation bar with 'Mendix Forum' in a blue box, followed by a dark grey banner with the text 'Ask questions and explore the knowledge within the community.' Below this is a navigation menu with 'Dashboard', 'Questions' (highlighted), 'Ideas', and 'FAQ'. On the right side of the menu is an 'RSS Feed' link.

The main content area shows a list of questions. At the top, it indicates '11,326 questions match your criteria' and includes a 'Sort by' dropdown set to 'Last Updated' and a green 'Ask a question' button. A search bar on the right contains the text 'What are you looking for?' and a search icon.

The list of questions includes:

- Date format acts weird**: 0 Votes, 2 Answers, 77 Views. Last changed 1 hour ago. Author: Nikel Krutzinga (963). Category: Java Actions.
- Installing Mendix application from the google play store**: 0 Votes, 1 Answer, 55 Views. Last changed 2 hours ago. Author: Willem van Zantvoort (4499). Categories: mobile, googleplay.
- Format parameter in text widget**: 0 Votes, 2 Answers, 27 Views. Last changed 13 hours ago. Author: Tim Baumer (2063). Categories: parameter, formatting. Category: Widgets.

On the right side, there are filters for 'My favorites', 'My own questions', and 'Status' (Unanswered, Answered, Accepted answered). Below these are 'Categories' (App Store, Connectors, Databases, Integrations, Java Actions) and 'Tags' (Microflow (532), widget (381), Java (360), Webservice (349), error (245)).

Important links : appstore

- ▶ Appstore : appstore.mendix.com
- ▶ Download the components to jumpstart your project, such as:
 - App services
 - Layouts
 - Themes
 - Modules
 - Widgets
- ▶ Support levels on Appstore Content
 - Platform
 - Extended Support
 - Community
 - <https://world.mendix.com/display/howto50/App+Store+Content+Support>:

The screenshot displays the Mendix App Store interface. At the top, there is a navigation bar with the Mendix logo and links for 'Add-ons', 'Apps', 'Getting started', 'Partners', 'Modeler', and 'My App Store'. Below the navigation bar is a search bar with the text 'Search the App Store' and a magnifying glass icon, and a green 'Add content' button. The main content area is divided into several sections:

- Featured:** A row of four featured app cards. From left to right: 'Push Notifications Connector' (5 stars), 'IBM Watson Connector Suite Example Project' (5 stars), 'SlackConnector' (5 stars), and 'Lucene text search' (5 stars). A 'View more' link is located to the right of this section.
- Categories:** Three category cards: 'Connectors' (Internet of things, Machine learning, Cognitive services, Data, More...), 'Modules' (Authentication, Messaging, Import/export, Tracing, More...), and 'Widgets' (Input, Display, Utility, More...).
- New content:** A section with a 'View more' link, containing three app cards: 'GroupBoxPlus' (10/31/2016), 'IBM Watson Connector Suite' (10/24/2016), and another 'IBM Watson Connector Suite' (10/24/2016).
- Recent updates:** A section with a 'View more' link, containing three app cards: 'CustomString' (11/4/2016), 'Vanilla Theme' (10/17/2016), and 'Search input widget' (10/13/2016).
- Most popular:** A section with a 'View more' link, containing three app cards: 'Company Expenses' (6611 downloads), 'Employee Directory' (3329 downloads), and 'Survey Builder DX' (1499 downloads).
- Reviews:** A section with a 'View full leaderboard' link, containing the text 'Top App Store contributors'.

















Important links : documentation

- ▶ Documentation : docs.mendix.com
- ▶ Contains the following :
 - Release Notes
 - API documentation
 - Reference Guide
 - Getting started / How-to's
 - Blogs
 - Support documentation

What can we help you with?

Search documentation

Mendix 6 How-to's

 Getting Started	 Data Models	 GUI's	 Logic & Business Rules
 Mobile	 Security	 Integration	 Extendability
 Custom Widget Development	 Monitoring & Troubleshooting	 Collaboration & Project Mana...	 Mendix Cloud
 Cloud Foundry	 On-premises Deployment	 Testing	 App Store

Deploy a Mendix App to HP Helion
Deploying a Mendix App to IBM Bluemix

Deploying a Mendix App to Pivotal
Deploy a Mendix App to Cloud Foundry

Important links : platform status

- ▶ Platform status : status.mendix.com
- ▶ Check status of Mendix in real time :
 - API (Deployment Portal / Platform Portal)
 - App Cloud Services
 - Mendix Cloud
- ▶ Incidents
- ▶ Maintenance
- ▶ Subscribe to updates

The screenshot displays the Mendix platform status page. At the top, a green banner indicates "All Systems Operational" with a refresh time of "2 minutes ago". Below this, a table lists various services and their status:

Service	Status
Deployment Portal / API	Operational
Platform Portal / API	Operational
App Cloud Services	Operational
Mendix Cloud	
Mendix Cloud UK	Operational
Mendix Cloud NL	Operational
Mendix Cloud US Central	Operational
Mendix Cloud US East	Operational
Mendix Cloud Free Tier EU	Operational

Below the table, a section titled "Scheduled Maintenance" features a blue banner for "Mendix Cloud - Free Tier upgrades" scheduled for "Jun 1, 08:00-23:45 CEST". The text below the banner states: "We will upgrade all sandboxes to Free Apps. Technical Contacts have been notified by email." and "Posted on Mar 23, 17:12 CEST".

The "Past Incidents" section is titled "Apr 5, 2016" and reports "No incidents reported today."

Important links : Cloud platform

- ▶ Cloud platform : cloud.home.mendix.com
- ▶ Customer self service management of apps by technical contact
- ▶ Deployments
- ▶ Backups
- ▶ Custom Domain URL
- ▶ Monitoring
 - Application status (all environments TAP)
 - Trends (graphs)
 - Alerts
 - Logs

The screenshot displays the 'Application Status' and 'Platform Status' sections of the Mendix Cloud platform. The 'Application Status' table shows the following data:

Type	Status	Status since
CPU	OK	2 days, 23 hours and 37 minutes
Critical Logs	OK	138 days, 21 hours and 27 minutes
Health Microflow	OK	138 days, 21 hours and 24 minutes
Running	OK	118 days, 21 hours and 35 minutes

The 'Platform Status' table shows the following data:

Type	Status	Status since
Application Server Disk Usage	OK	412 days, 2 hours and 19 minutes
Application Server Memory	OK	412 days, 2 hours and 18 minutes
Application Server Up	OK	462 days, 19 hours and 42 minutes
Database Server Disk Usage	OK	412 days, 2 hours and 10 minutes
Database Server Up	OK	484 days, 3 hours and 42 minutes
Webserver	OK	295 days, 6 hours and 0 minutes

The screenshot displays the 'Backup Guide' page, which includes a table of deployment history and a list of backup management actions. The deployment history table shows the following data:

DATE	Application Status	ID	DEPLOYMENT PACKAGE	COMMENT	Status since	Details
Mon, 04 Apr 2016	OK	201604042206	1.0.0.15725		2 days, 23 hours and 37 minutes	Details
Sun, 03 Apr 2016	OK	201604032150	1.0.0.15725		138 days, 21 hours and 27 minutes	Details
Sat, 02 Apr 2016	OK	201604022203	1.0.0.15725		138 days, 21 hours and 24 minutes	Details
Fri, 01 Apr 2016	OK	201604012202	1.0.0.15725		118 days, 21 hours and 35 minutes	Details
Thu, 31 Mar 2016	OK	201603312157	1.0.0.15725		118 days, 21 hours and 35 minutes	Details

The 'Backup Guide' section on the right explains that backups are automatically created every night and lists the following backup retention policies:

- Nightly Backups: maximum 2 weeks history (counting from yesterday)
- Sunday Backups: maximum 3 months history (counting from yesterday)
- Monthly Backups (1st Sunday of each month): maximum 1 year history

Below the table, there are buttons for 'Create Backup', 'Upload Data', 'Restore Backup', and 'Download Backup'. The table also includes a '35 items in total' indicator and a pagination control showing '1 2 3 ... 7'.

Important links : Cloud platform - maintenance

- ▶ Cloud platform : cloud.home.mendix.com
- ▶ Preferred maintenance window
- ▶ Email alert for planned maintenance
- ▶ Possibility to override preferred window

The screenshot shows the 'Maintenance' tab in the Mendix Cloud platform interface. At the top, there are tabs for 'Deploy' and 'Backup'. Below them is the 'Environment Details' section with a 'Go back' link. A navigation bar contains tabs for 'General', 'Model Options', 'Network', 'Loglevels', 'Advanced', and 'Maintenance', with 'Maintenance' being the active tab. The main content area is titled 'Preferred Maintenance Window' and includes a light blue instruction box: 'Configure your Preferred Maintenance Window. A weekly time range (in UTC) where system maintenance can occur.' Below this, the current window is listed as 'Monday 12:00-15:00 UTC' with a 'Change' button. The 'Planned Maintenance' section features a blue 'Override' button for a '2016Q2 Mendix Cloud infrastructure upgrade'. The text below the upgrade details states: 'Maintenance will be executed between **Mon 05/16/2016, 14:00 +0200** and **Mon 05/16/2016, 17:00 +0200**. The underlying infrastructure of your Mendix App will be upgraded. Your Mendix App will be restarted. No action from you is required. Expected downtime: Guaranteed under 1 hour. In most cases around 10 minutes. Impact: - Hypervisor: operating system upgrade, no impact on virtual machine level - VM: Minor security updates within the virtual machine on current stable version of the operating system - Application: none. The operation will take place within your configured maintenance window, you can change the window for this environment up till one hour before the maintenance window starts.'

Important links : Cloud platform - trends

- ▶ Cloud platform : cloud.mendix.com
- ▶ Customer Self Service monitoring of trends
- ▶ Application Statistics
 - External request User accounts
 - Cache
 - Jetty threadpool
- ▶ Database Statistics
 - Transactions
- ▶ Application Node Statistics
 - CPU
 - Average load
 - Disk latency
 - Disk usage
- ▶ Database Node Statistics
 - CPU
 - Average load
 - Disk latency
 - Disk usage
 - DB connections

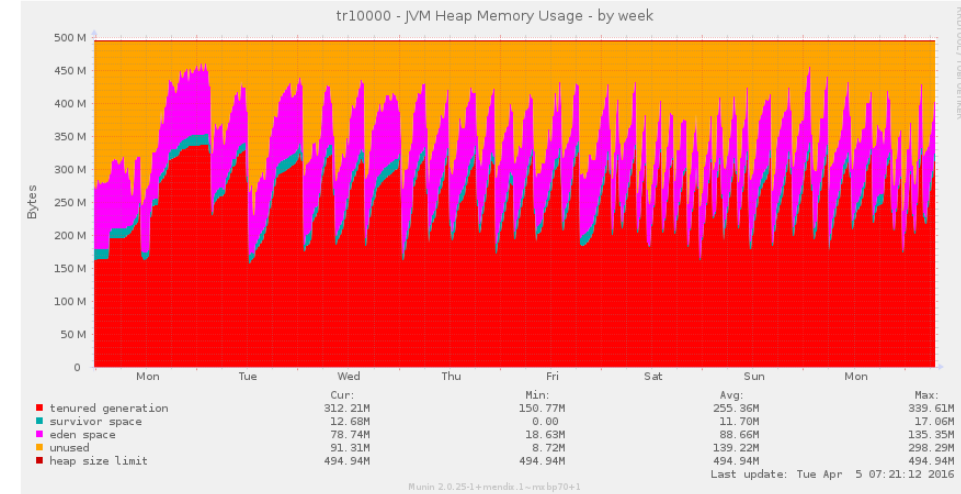
JVM Heap
Database queries

Table vs index size

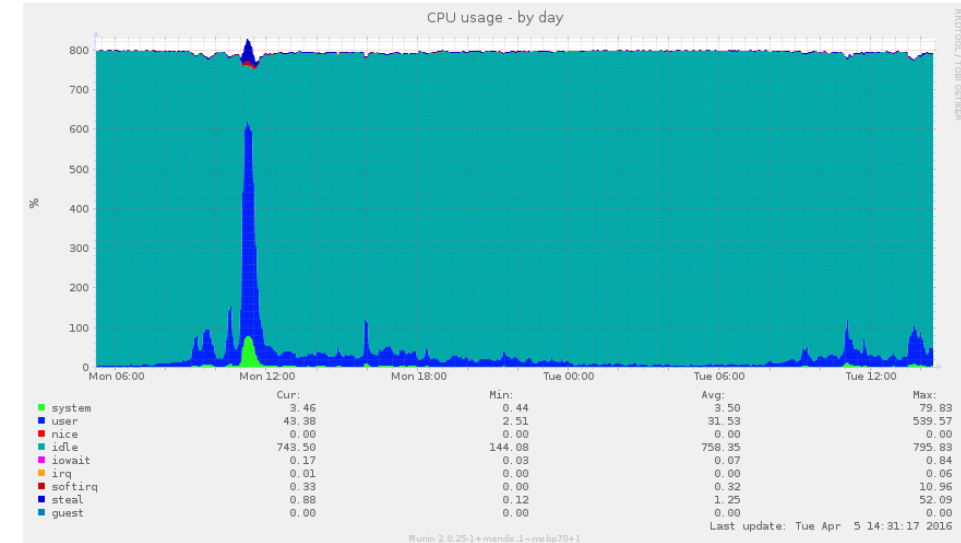
OS memory
Disk throughput
Disk utilization

OS memory
Disk throughput
Disk utilization

JVM Object Heap



Application node CPU usage



Important links : support portal

- ▶ Support portal : support.mendix.com
- ▶ Contains the following :
 - Submit and browse tickets
 - View own tickets and tickets on company and affected app level
 - Incidents
 - Standard Changes
 - ▶ New App, Resizings, Reset Google authenticator etc.
 - Non standard changes
 - Questions

The screenshot shows the Mendix Developer Support Portal homepage. At the top, there is a dark blue header with the 'mx mendix developer' logo on the left and 'Submit a request' and 'Sign in' links on the right. Below the header is a light gray section with the text 'What can we help you with?' and a search bar containing the word 'Search'. The main content area features six orange icons arranged in a 2x3 grid, each with a corresponding label: 'KNOWLEDGE BASE' (target icon), 'RELEASE NOTES' (document icon), 'COMMUNITY FORUM' (speech bubbles icon), 'APP STORE' (shopping cart icon), 'PLATFORM STATUS' (person with speech bubble icon), and 'CLOUD PORTAL' (cloud icon). Below this grid is a light gray bar with a telephone icon and four columns of contact information for different regions: United States (+1 617 939-9638), Netherlands (+31 10 478 8848), United Kingdom (+44 3308 280000), and South Africa (+27 11 550 2419). At the bottom, there are two columns of links: 'FAQ' with five links (including 'How to submit a ticket - quick reference for endusers', 'Ticket migration to new Support portal', 'How to download a backup', 'How to unlink (delete) your sandbox and connect the project to a licensed node', and 'How to restore a backup') and 'ANNOUNCEMENTS' with three links (including 'New Support Portal', 'Version 6.7 has been released', and 'Announcing Mendix 7'). A link 'See all 14 articles' is located at the bottom left of the FAQ section.



Q&A