

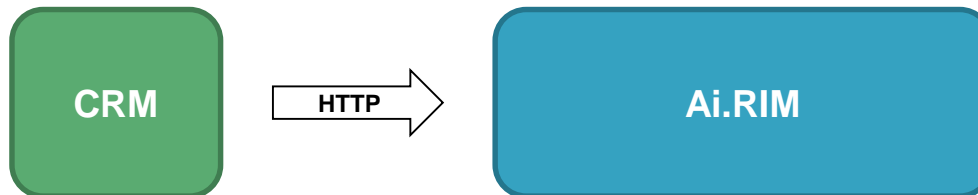
# Ai.RIM – Resource and Inventory Management

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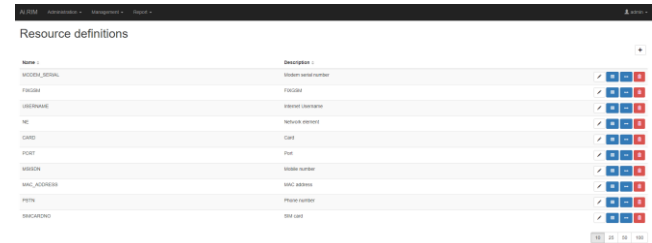
# What is Ai.RIM?

- Platform for management of physical and logical resources
- Resource is generic; can be anything that requires management of state and ownership
  - Typical resources: SIM cards, mobile and fix phone numbers, modems, smart cards, usernames, IP addresses...
- Exposes web service interfaces (SOAP and REST) towards other systems (such as CRM)

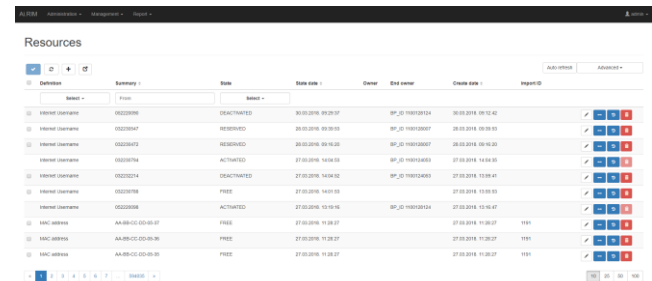


# Resource Definitions

- Resource Definition defines type of resource
- Each Resource Definitions can be assigned multiple parameters that further describe that resource
- Once resource is defined, an instance of Resource Definition is a concrete resource
  - For example, for a Resource Definition called MODEM, we define parameter MAC\_ADDRESS. A concrete instance of such resource is a modem having MAC address aa:bb:cc:dd:ee:ff.



Name	Description			
MODEM_SERIAL	Modem serial number	✓	🔍	✖
FQDN	FQDN	✓	🔍	✖
USERNAME	Username	✓	🔍	✖
NET	Network subnet	✓	🔍	✖
CARD	Card	✓	🔍	✖
PORT	Port	✓	🔍	✖
MODEM	Modem number	✓	🔍	✖
MAC_ADDRESS	MAC address	✓	🔍	✖
IPV4	IPv4 address	✓	🔍	✖
IPV6	IPv6 address	✓	🔍	✖
SECURITY	Security level	✓	🔍	✖



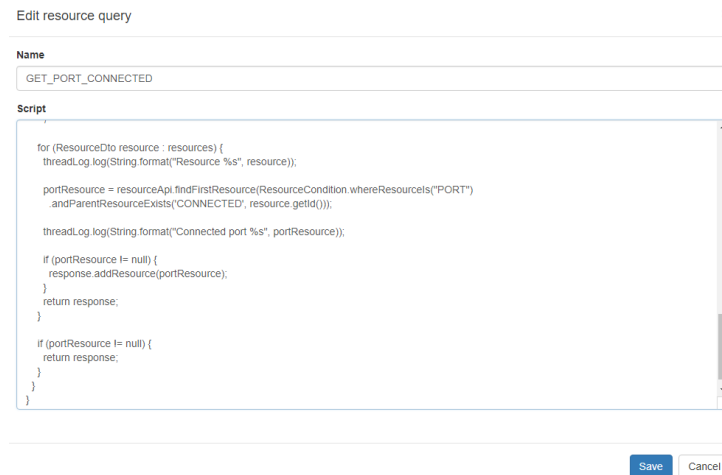
Definition	Summary	Status	Start time	Owner	End time	Check time	Impact ID			
Modem	00000001	DEACTIVATED	30.03.2016 09:20:37	BP_0010000001	30.03.2016 09:32:42			✓	🔍	✖
Modem	00000002	RESERVED	30.03.2016 09:30:35	BP_0010000002	30.03.2016 09:30:35			✓	🔍	✖
Modem	00000003	RESERVED	30.03.2016 09:30:35	BP_0010000003	30.03.2016 09:30:35			✓	🔍	✖
Modem	00000004	ACTIVATED	27.03.2016 14:38:33	BP_0010000004	27.03.2016 14:38:33			✓	🔍	✖
Modem	00000005	DEACTIVATED	27.03.2016 14:38:32	BP_0010000005	27.03.2016 14:38:32			✓	🔍	✖
Modem	00000006	FREE	27.03.2016 14:38:32		27.03.2016 14:38:32			✓	🔍	✖
Modem	00000007	ACTIVATED	27.03.2016 14:38:32	BP_0010000007	27.03.2016 14:38:32			✓	🔍	✖
MAC address	AA:BB:CC:DD:EE:FF	FREE	27.03.2016 14:38:32		27.03.2016 14:38:32		1101	✓	🔍	✖
MAC address	AA:BB:CC:DD:EE:FF	FREE	27.03.2016 14:38:32		27.03.2016 14:38:32		1101	✓	🔍	✖

# Resource Relations

- On Resource Definitions, we may define allowed relationships between Resource Definitions
- Like resources, relations can be logical or physical
  - For example, we may define a pairing relation between a SIM card and an MSISDN, or between a phone number and a port on a switch
- Resource relations may also define how different components of a managed resource are connected (a switch may have a slot, which may have a port, etc.)

# Resource Queries

- Resource Queries are executable Groovy scripts used to extend Ai.RIM
- When Ai.RIM is invoked by external system, a resource query is executed
  - It may perform actions such as returning a list of resources, reserving a resource for a customer, changing relations between resources, etc.



The screenshot shows a web-based interface for editing a resource query. The title bar reads "Edit resource query" with a close button (x). Below the title bar, there is a "Name" field containing the text "GET\_PORT\_CONNECTED". Underneath is a "Script" field containing Groovy code. The code is as follows:

```
for (ResourceDto resource : resources) {
    threadLog.log(String.format("Resource %s", resource));

    portResource = resourceApi.findFirstResource(ResourceCondition.whereResources("PORT")
        .andParentResourceExists("CONNECTED", resource.getId()));

    threadLog.log(String.format("Connected port %s", portResource));

    if (portResource != null) {
        response.addResource(portResource);
    }
    return response;
}

if (portResource != null) {
    return response;
}
}
```

At the bottom right of the dialog, there are "Save" and "Cancel" buttons.

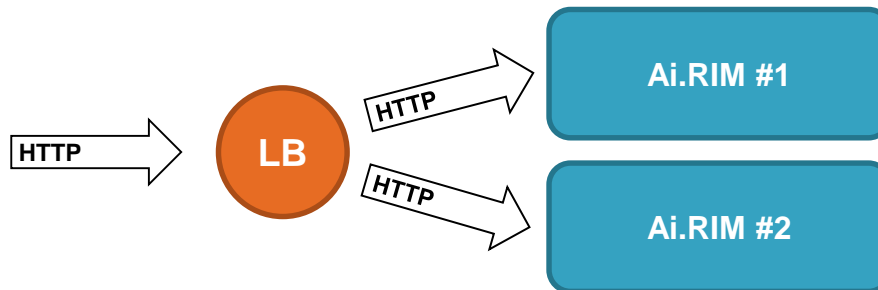
# Bulk Actions

- Several actions can be performed in bulk:
  - Massive imports of resources through CSV files
  - Bulk querying of multiple resources by various filters
  - Bulk reservation, freeing, or updating resources

The screenshot shows a web application interface for performing bulk actions. At the top, there is a navigation bar with 'AI, RIM', 'Administration', 'Management', and 'Report' menus, and a user profile 'admin'. The main heading is 'Bulk action'. Below this, there are several tabs: 'Reserve resource', 'Release resource', 'Delete resource', 'Update parameter', 'Create relation', and 'Delete relation'. The 'Reserve resource' tab is active. The interface is divided into two main sections: configuration and preview. The configuration section includes: 'Separator' (Space, Comma, Semicolon), 'Line format' (Resource Identifier, End owner value), 'File' (No file, Select file), 'Resource type' (Resource, No resource type), and 'End owner' (End owner, No end owner type). A 'Start' button is at the bottom left. The preview section, titled 'Preview (0)', shows a table with three columns: 'Summary', 'End owner value', and 'State'. The table is currently empty.

# Architecture

- Running on Apache Tomcat, with a web GUI
- May be running on multiple nodes, where each node is stateless
  - This allows horizontal scalability with little effort – there is no limit on the number of nodes
- Load balancing and failover is done through hardware load balancers or software load balancers (nginx)
- Database abstraction layer allows supporting multiple relational database vendors (running on Oracle by default)





# Thank you for your attention!

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