



Lokomo Servicenter™

Product description



Today's IT challenges

Today, IT-departments and data centers are under pressure between two challenging development trends:

- **Increased complexity**

The computing environment is getting more and more complex. New architectures (web-based applications, multi-tier applications, etc) require more servers, network and storage components. This complexity leads to long turn-around time, increased cost and low visibility (difficult to know current status of a service).

- **Business pressure**

IT-departments are evolving from being cost centers into becoming profit centers with offerings to customers. Offerings are now clearly defined as a set of fulfillment requirements (Service Level Agreements, SLA:s). Therefore, IT-departments experience an increased pressure to cut cost, meet time-to-market, become more flexible and increase Return on Investment (ROI).

IT-department offerings are, to a great extent, services: A group of co-operating applications running on servers in a production environment. Services are typically delivered via PC:s over Internet, intranet or extranet. As a result, the service becomes the natural object to which revenue and commitment is associated. It must therefore be a primary managed object from a planning, operating and reporting perspective. It becomes imperative to be aware of, and have control of, the cost of offering the service. It is also vital to have a good service visibility in order to plan ahead and prevent mishaps. Service control and visibility are only possible when working with the service as a managed object, rather than with the underlying parts of the production environment. In other words, it is necessary to work in a service-centric way.

Today, a number of measures are taken to tackle the increased complexity and business pressure. From the technological side, actions are taken to standardize the production environment and to modularize its functionalities. On the operational side, there is an increasing interest in standardizing the workflow into a number of well-specified processes (e.g. the IT Infrastructure Library, ITIL, effort), and to automate manual tasks as far as possible. These developments are gaining even more momentum due to the strong outsourcing trend.

Lokomo Servicenter tackles today's IT challenges

Lokomo offers a solution, the Lokomo Servicenter, which offers unprecedented service control, visibility and quality. Lokomo Servicenter is a productivity tool enabling efficient delivery of services in a complex production environment. It is designed to operate in any server-based environment, independent of architecture, brand and OS-types. It is capable of making use of existing systems (Configuration Management Databases, Inventory Systems, etc.) and it is adaptable to the work processes of each organization.

By using Lokomo Servicenter, a data center is able to reach unprecedented cost and time saving in the operation and management of services. This is equally valid for internal IT-departments as for organizations offering services to external customers.

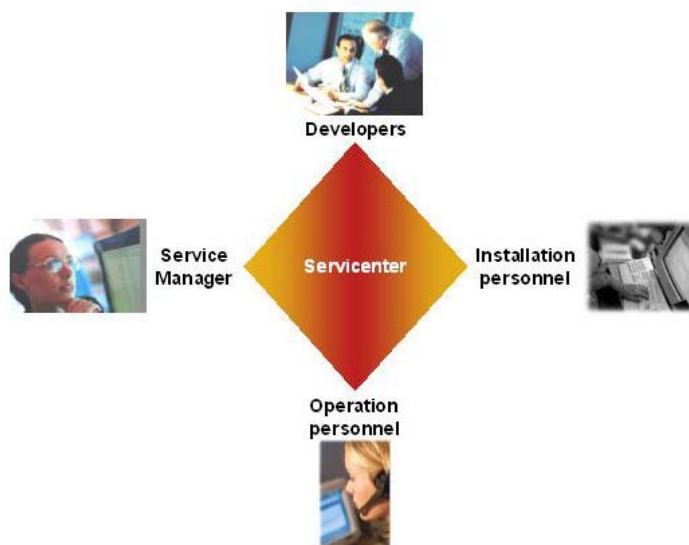


Figure 1: Lokomo Servicenter organizes and facilitates work for the whole staff

Lokomo Servicenter is the focal point for collecting and reporting all operationally related information about the service. So, in general, the categories of personnel that interact with Lokomo Servicenter are installation personnel, operation personnel, service managers, and application developers.

Functions in Lokomo Servicenter

Lokomo Servicenter is built on three cornerstones: Service-centricity, process support and automation.

Service-centricity

Service-centricity gives operational staff the possibility to interact with the production environment with a service perspective in two ways:

1. **Aggregation**

Status reports and information about the effect of changes in the production environment are aggregated and presented with a service perspective. For instance, it is possible to preview the impact of a service capacity update and estimate the actual cost of the action before it is performed. This is very useful as it is often difficult to conclude how errors or changes in the production environment will impact a specific service.

2. **Propagation**

Each action initiated for a given service is decomposed into multiple sub-actions targeted at the software components that build up the service. Each such sub-action is executed in a pre-defined order and takes relations and dependencies to the production environment into account. Even the smallest change often has a cascading effect on numerous of components in the data center. Realizing the service capacity update described above, by introducing an extra server means that numerous of applications on other servers must be reconfigured along with load balancers and storage components.

A graphical user interface in Lokomo Servicenter shows all reports in a user-friendly way and information is available at an eye glimpse.

Service visibility has never been so clear. The same user interface allows operational personnel to initiate actions on the services. With a simple mouse click it is now possible to increase capacity on the fly or apply the latest software patch.

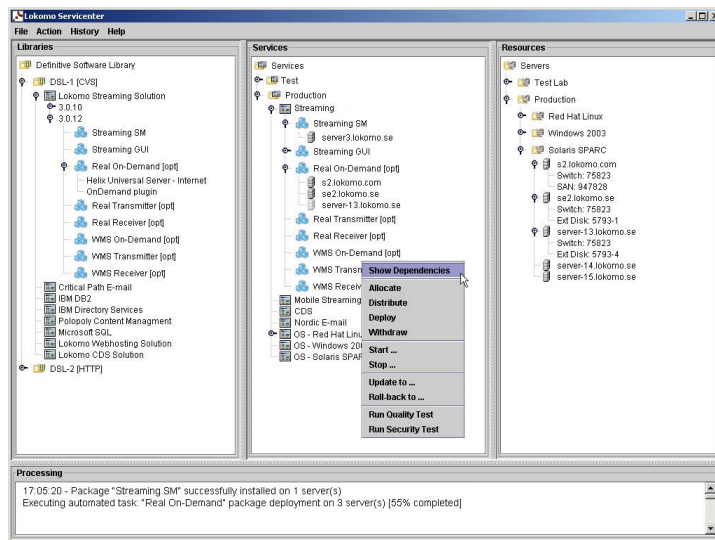


Figure 2: An example of a service-centric view

Process support

Many efforts to rationalize data center work have been initiated within the IT industry. The Information Technology Infrastructure Library, ITIL, is one of them. ITIL is gaining momentum as a standard model for IT service management processes. Lokomo Servicenter offers support for processes defined by ITIL, such as for Release Management and Service Delivery.

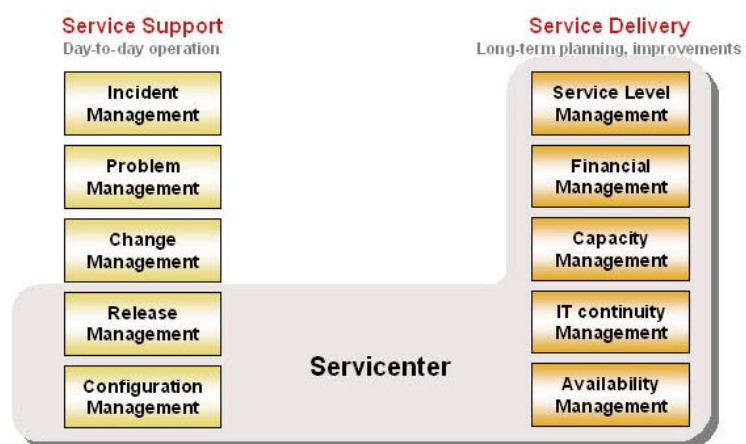


Figure 3: ITIL processes covered by Lokomo Servicenter



● **Release Management**

● Lokomo Servicenter takes care of release planning, validation, execution and rollback for test and production environments.

● Roles are assigned to different persons or groups of persons and are mapped to functions and privileges. All personnel involved get assistance on what to do, how to do it (via tailor-made manuals) and when to do it (via a notification service). This ensures that information flow is streamlined and that mistakes are avoided, increasing efficiency and service quality.

● Once an action is completed, Lokomo Servicenter compiles an action report and notifies the person responsible. If the action was successful and validated, the next action can then begin. Of course, the Configuration Management database, CMDB, is instantly updated as soon as changes occur.

● Similarly, during service operation and optimization, Lokomo Servicenter organizes a team's work to perform patch rollouts or capacity and availability updates.



● **Service Delivery**

● Lokomo Servicenter supports the Service Delivery processes by providing meaningful and up-to-date information about the services.

● Lokomo Servicenter aggregates information from various sources (CMDB, inventory systems, Network & System management systems, etc.) and compiles a number of task specific reports. Using Lokomo Servicenter, Service Managers are in control and can check status, production cost, fetch data to calculate business offers, give permissions for operational changes, release of new versions, etc.



Examples of reports are:

- Calculation of cost-by-service
- Estimation of cost of change (e.g. how much will a capacity update cost, including the cost of new hardware and software but also the costs related to installation and integration)
- Service availability report based on Component Failure Impact Analysis (CFIA)
- Capacity report with history and trend
- SLA/OLA monitoring, including breaches report

The reports can be exported to various formats for further processing in a legacy planning system or a spreadsheet, like Excel.

Lokomo Servicercenter can be configured to send alarms (email, SMS, etc.) when certain combinations of conditions are met. Hence, it is possible to track critical and crucial situations from a service perspective, as opposed to the traditional way of monitoring unit by unit in the production environment.

Service Managers can also specify policies on how to resolve issues in critical situations. For example, the loss of an essential service component could trigger the automated deployment of a replacement until the root cause of the problem has been identified and dealt with.

Automation

Lokomo Servicercenter controls and monitors the execution of automated tasks during deployment, operation, optimization and withdrawal, all from a central location.

With Lokomo Servicercenter it is easy to deploy a complex, multi-tiered and multi-server-based service in minutes. Through simple drag-and-drop, the capacity of any service can be increased or decreased. It is so easy that it can be used for resource allocation on a daily basis as a way to increase utilization of the data center resources.

Lokomo Servicercenter provides a library of standard automated tasks that covers the most common tasks required during service operation. The library contains for instance ready-made scripts to configure global and local load balancers (Cisco, F5), firewalls (ipchains, ICF, IPsec), clusters, SAN, etc. Customers can extend the library with their proprietary tasks.



Data-model

Lokomo Servicenter features a unique way to organize information about a service in order to realize the wanted service-centricity. The information is divided into three main categories:

Service specific information

The Service Description is a unique XML-based description that encapsulates expert knowledge about a service. The Service Description contains all service-specific information necessary during deployment, operation, optimization and withdrawal of the service, which for instance includes the following:

- A description of the service's components
- The dependencies between the components
- Monitoring metrics and events
- Service Level Agreement targets
- Operational tasks, like installation, start, stop, patch rollout
- Test tasks for e.g. security, performance, capacity and availability

The Service Description is specified during development and is used during operation. As most expert knowledge is present in the Service Description, no expert is required for day-to-day service operation!

Service developers and architects create the Service Description. The amount of work required is comparable with what is spent on creating traditional paper manuals, but the usefulness of the Service Description is superior as it is machine-readable. It forces service developers and architects to take a service perspective, i.e. to take scalability, availability, performance, etc into account. Developers get support to incorporate and test operational aspects.

The Service Description ensures that a service will perform as intended in the production environment. It also increases quality and decreases lead-time. Lokomo Servicenter provides a tool, the Service Constructor, to help produce and test Service Descriptions.



Environment specific information

This information relates to the environment the service is deployed in. It contains information about what type of equipment is used, environment architecture, software versions, various cost parameters, equipment specific scripts, etc. This information is either extracted from existing Configuration Management Systems and Inventory Systems or collected by Lokomo Servicenter.

Process specific information

Process information is unique to each IT department and data center. It relates to how each organization structures work processes (work flow, responsibilities, privileges, specific manuals, etc.).

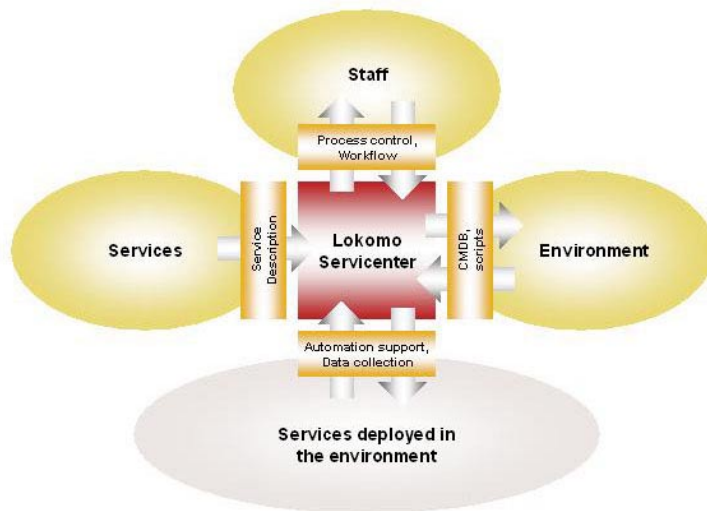


Figure 4: Lokomo Servicenter data-model - aligning staff, services and environment

Lokomo Servicer components

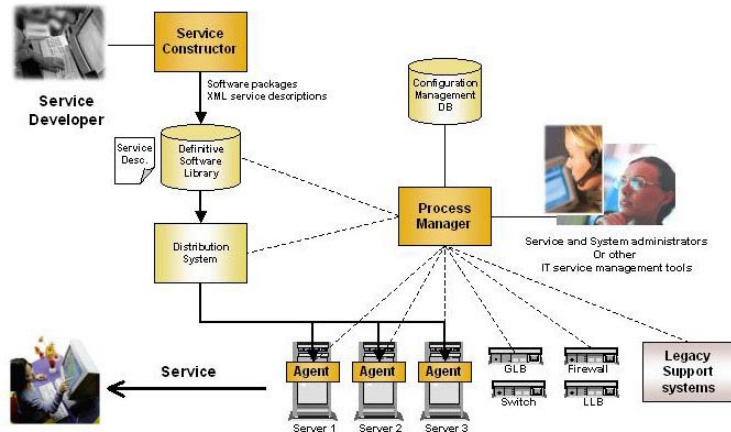


Figure 5: Components of the Lokomo Servicer

Process Manager

The heart of the Lokomo Servicer is the Process Manager. This software component is in charge of processing Service Descriptions, maintaining workflow and controlling the execution of automated tasks.

Agents

Lokomo Servicer uses software Agents to control and perform automated tasks. Agents are slim software components installed on the servers in the test and production environment. They fulfill several functions, like:

- Task execution and status report.
The Process Manager sends tasks to an Agent. Examples of tasks are installing and configuring software components or gathering usage information. Once a task is complete, the Agent sends back a status report.
- Managing and controlling network and storage components.
These Agents are installed on some of the servers in the environment but are remotely performing task execution and audit on the network and storage components.
- Hardware/software audit and server management.
The Agent reports to the Process Manager all changes applied to the server it is monitoring, which ensures that the Configuration Management Database (CMDB) is up to date. In addition to typical SNMP-related things like disk space and TCP/IP ports in use, it can also be service specific information.

Definitive Software Library

The Definitive Software Library, DSL, is a repository of definitive versions of all software packages used by a service. Master copies of the Service Descriptions are also stored in the DSL. This storage area may in reality consist of several, physically distributed, file stores. The DSL is coupled to the Process Manager to control user access and privileges.

Configuration Management Database

Lokomo Servicercenter includes a Configuration Management Database, CMDB, as a source of information about the production environment(s). Lokomo Servicercenter uses the Agents to perform an inventory of all the servers installed in the environment and the CMDB is then populated and maintained automatically in real-time. Lokomo Servicercenter has an API to interface with existing, legacy CMDB(s) in the data center.

Distribution System

Lokomo Servicercenter has a powerful, scalable and secure distribution system capable of handling LAN, MAN and WAN environments. The distribution system is used for sending all necessary software packages and Service Descriptions to all servers involved in providing the service. Lokomo Servicercenter can also invoke an existing application deployment system to move files to the target machines.

Security

Lokomo Servicercenter is built with security in focus. All communication between the Process Manager and the Agents are encrypted using SSL, relying of client and server authentication using individual certificates. This ensures that Agents only receive commands and binary packages from authorized Process Managers.

Moreover, all automated tasks are signed. This means that the Agents only execute approved tasks. No unknown task will ever be executed by the Agents.

The distribution system provided by Lokomo Servicercenter also uses certificates to encrypt and authenticate all communications.

- Finally, all Lokomo Servicer users are authenticated and assigned
- roles and varying privileges. The Process Manager makes sure each
- user only view and act on information he or she is allowed to manage.



System Requirements

Supported/interfaced products

Hardware platforms:	Intel, Sparc
Operating systems:	Unix, Linux, Solaris, HP-UX, AIX, Windows
Routers, switches, load balancers:	F5, Cisco, Nortel, Extreme
Network & systems management systems:	HP Openview, IBM Tivoli, CA Unicenter, BMC Patrol
Relational databases:	IBM DB2, Oracle DBMS, HSQL
Application servers:	Apache, Tomcat, Websphere, Windows Media Server, Real Server

Please, contact Lokomo Systems for a complete list.





Svärdvägen 27 • SE-182 33 Danderyd • Sweden • Phone +46 8 5490 4380 • Fax +46 8 446 5095
www.lokomo.com

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