

# FixStream Business and Application Service Groups

## Align Operational Visibility with Top Level Business Goals

### Meridian Approach

- Categorize software and system resources into hierarchical business application and service groups which can be visualized and tracked over time
- Enable each level of the organization to define service groups in a way that is most useful to that team
- On top of each group map contextual layers of information from different sources to accelerate troubleshooting, optimization and planning

### Looking Tops-Down

A tops-down approach to managing business services and applications is more efficient and strategic. A higher vantage point enables IT teams to align and justify their activities against business objectives and ROI driven investments. It also aligns with end user service driven methods like Agile and DevOps where IT must work very quickly with software development in a service driven environment that is widely distributed across the infrastructure. A holistic view of all software and infrastructure is critical in this new world.

### What's an application?

But traditional IT tools were designed around bottoms-up silos and rigid data models that limit the ability to process information from the perspective of the business. To make matters more complicated in the IT or software context the word "application" is an abstract & loosely coupled term which means different things to different people depending on what role each user is playing. Here are few examples what this means.

- **Network, System or Storage Administrators:** Anything that runs on an O/S is an application. A database, application server, web server is an application for this community.
- **DBA, Web, and Middleware:** Typically PaaS administrators deliver a platform to development community and everything developed on top of the platform is an application for them.
- **Developer Community:** All the logical services offered to their end business user are an Application. For a typical developer Sales Forecasting could be an application, which is deployed using a combination of databases, app servers, web servers and messaging resources.
- **End Business User:** A "URL" is an Application. For example, an a typical end user for an ordering system punches in a URL and from there on everything the user does like searching product, placing order, checking pricing, entering payment details, and final checkout is one ordering application.

In addition as you go up the ladder, the expectation from senior management and the CXO community is to get a simple view of how top-level business processes and next level business services are behaving. They want to know in a single click if everything is fine and if not then pin point the exact issue in just a few clicks.

**Business Process Model Hierarchy**

**Example -1**

Industry: Retail Banking  
Business Process – Personal Loan

**Example -2**

Industry: Telecom  
Business Process – Customer Care

**Business**

Business Process Analytics and SLA Assurance	Forecast vs. Actual Map, SLA violation, Transaction Troubleshooting, Root Casue Analysis	Forecast vs. Actual Map, SLA violation, Transaction Troubleshooting, Root Casue Analysis
Business Process SLA	Forecast vs. Actual Map, SLA violation, Transaction Troubleshooting, Root Casue Analysis	Forecast vs. Actual Map, SLA violation, Transaction Troubleshooting, Root Casue Analysis
Business Process Definition	Collection of linked activities for personal loan	Forecast vs. Actual Map, SLA violation, Transaction Troubleshooting, Root Casue Analysis

**Application**

Business Services	Receive Application, Check Credit, Negotiate Loan, Choose loan	Add Service, Process Order, Submit trouble ticket, View/Pay bills, increase QoS
Business Applications	Loan Originating, Risk Management System, Enterprise Content Management	Billing, Ordering, Provisioning, Credit and Collection, Product Catalog and Pricing, Suppy Chain
Application Services	Tomcat, Oracle, SAP	Oracle CRM, Weblogic, Cassandra, Apache Web Server

**Infrastructure**

Infrastructure Entities	Servers, VMs, Hypervisor, Switches, Routers, Firewalls, Load Balancer, Storage Devices (physical and Virtual, On-Prem and hybrid).
Business Services	
Business Services	

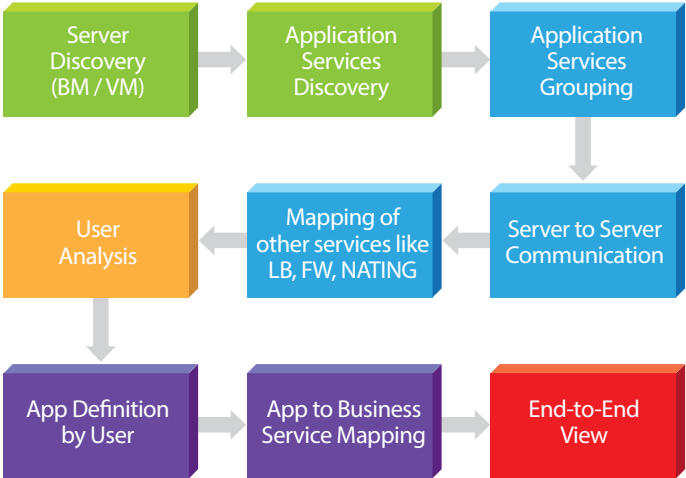
**Hierarchy of Business and Application Services**

For the purpose this discussion business processes are the highest-level business functions (ex. Customer Care), business services and business applications are the next levels down (ex. Process order, Billing) and application services (ex. Apache, Cassandra, Oracle...) and infrastructure resources (storage, network, compute...) are the lowest level of application and infrastructure building blocks.

### FixStream Application Discovery

FixStream has unique patented approach that provides the appropriate level of visibility to each level of business and technical hierarchy. The heart of the solution is an automated process to discover and inventory all the different application and infrastructure resources in the data center, correlate how they are interacting with each other and then help user define logical groups and hierarchies which can be persisted and tracked over time.

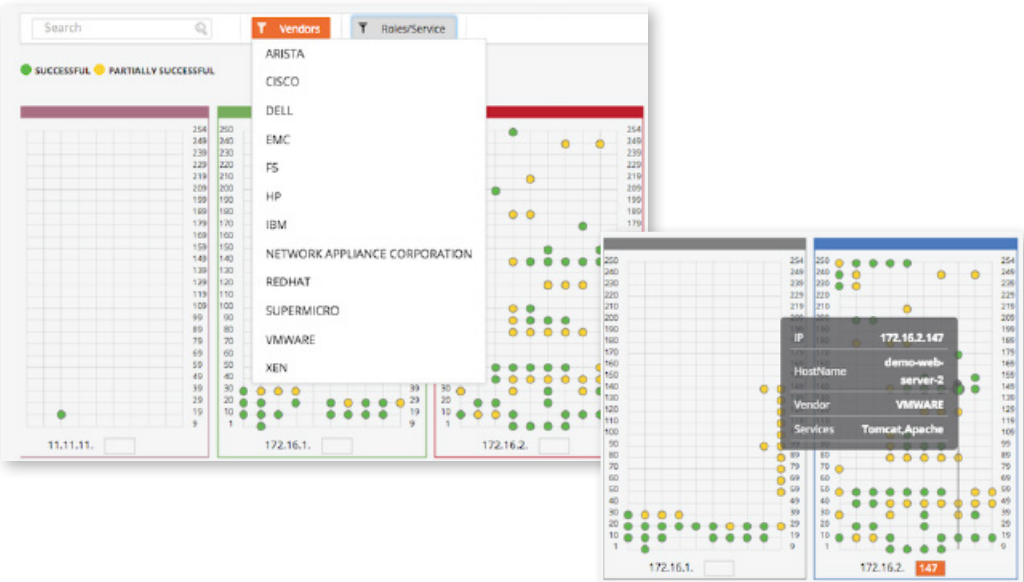
These result in a holistic mapping of how the highest level business processes are associated with low level infrastructure resources like virtual machine, v-switch, router, firewall, etc. In the following sections we will go over high-level details of how Meridian accomplishes this.



Meridian Discovery Process Flow

### Server Discovery

The Meridian Data Collector (DC) module is set up to discover all the servers running in the data center. The DC identifies all the bare metal and virtual machines in the data center and all the associated properties. This is the first building block of the application discovery.



Automated Inventory screen shows the identity and location of all virtual and physical resources discovered by the Data Collector

## Application Services Discovery

Once all the servers mentioned above are identified, on a periodic basis the DC gathers key attributes required to identify different application services. Some of the parameters used to identify application services are listening ports and processes running on the server. The DC is easily extensible to discover new application services.

### Supported Databases & Applications

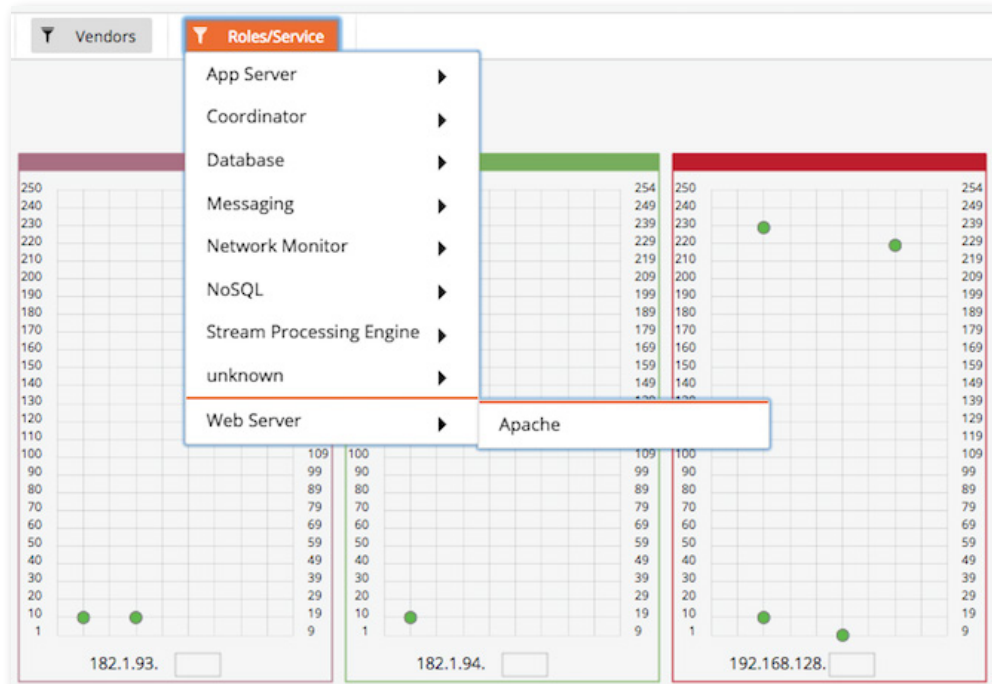
<b>Databases</b>	MySQL, MS SQL Server, Oracle
<b>Application Servers</b>	Jboss, Tomcat, Weblogic, WebSphere
<b>Distributed real-time computation</b>	Storm
<b>Web Servers</b>	Apache, IIS, PHP
<b>Messaging</b>	Kafka, MSMQM, Tibco, WebSphere MQ
<b>NoSQL</b>	Cassandra, Elasticsearch, HBase, MongoDB
<b>JRE / JDK</b>	IBM JDK, OpenJDK
<b>Common Services</b>	DNS, FTP, JMS, SNMP

Bold items include performance metrics; Additional discovery libraries can be dynamically added

### Example application services tracked by Meridian

From this data Meridian tries to assign a single or multiple roles to the server like database, application, web server etc. Typically this is identified against the Meridian data store which comes bundled as part of the product. FixStream has put significant effort into developing this data store which acts as single source of truth for higher correlation and visualization functions in the platform.

For the best results, it is recommended that customers run this process once each day for any newly added servers and then on a weekly basis to capture any changes in steady state. This helps identify new applications on an ongoing basis.



Automated Inventory screen provides filters to show which application services are running on which virtual and physical infrastructure resources

## Application Service Clustering

As part of data collection and data normalization, the Meridian Correlation Engine (CE) logically groups application services. As an example, multiple nodes of Cassandra will be grouped as one cluster, multiple oracle instances will be grouped as Oracle RAC database etc. This helps in application monitoring and application definition and reduces the burden on the user to group them together for future consumption.

## Server-to-Server Communication

Once all the servers are scanned and analyzed the Meridian DC starts gathering traffic patterns flowing between the servers. It uses tcpdump/windump or netstat commands depending on user preference. It also has the ability to integrate with 3rd party tools in case the customer has already deployed them for network analysis. The data quality and analysis will be richer if the data is collected more frequently. There could be situations where an application is invoked only during certain periods of the day / week / month / quarter so it may take some time to identify this communication and hence the application discovery.

## Service Chaining

In addition to application grouping Meridian contains patented Flow2Path™ technology that identifies all flows and associated paths of communication between application services. It has ability to identify virtual overlays and physical underlays, NAT-ing inside load balancers and firewalls, Layer2 to Layer3 transitions and other complexities to resolve the traffic patterns associated with server-to-server communication. This helps build application layouts so the user does not have to worry about figuring out detailed relationships between resources during the setup.

## User Analysis and Application Definition

Meridian helps users define business applications via its rich user interface. It has the concept of a business application center around which groups are formed. The center is the application service that is most heavily used or critical to a higher-level business application (ex. Oracle database for billing system). The user selects an application center then Meridian shows all the other application services that are one hop (ex. Additional databases or app servers), two hops (web servers) or more away based on how broadly the user wants to scope the group. The user can then select, edit and drop all these application services into a group and assign a name to it.

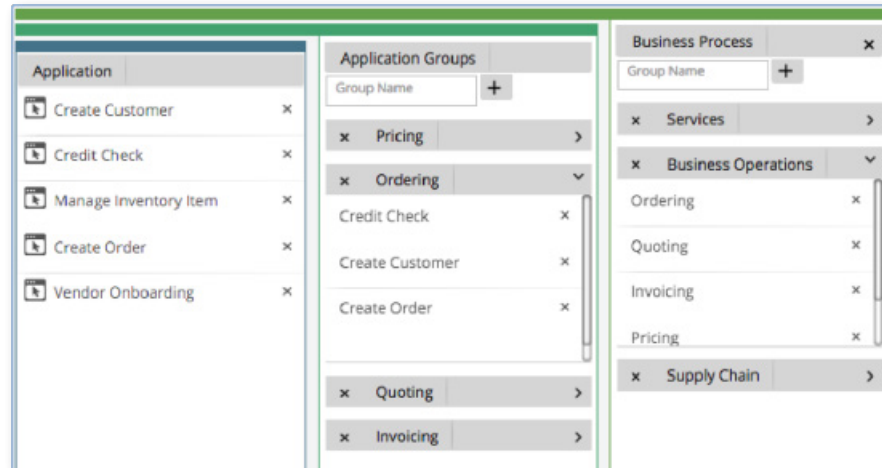
**On the right is an auto-discovered first hop application services. On the left the user names a group containing these services**

The screenshot displays the Meridian user interface. On the left is a navigation sidebar with options: USER MANAGEMENT, DASHBOARD, DISCOVERY, INVENTORY, CAVAS INVENTORY, CUSTOM LAYOUT, TOPOLOGY, APPLICATIONS, APPLICATION(S) NEW, EVENT CENTER, and PERFORMANCE. The main area is titled 'Application Discovery' and shows a table of discovered services. Below the table, there is a 'Chart View' showing a network diagram with nodes and connections, and a 'Table View' with a step-by-step process: 1. Select Service, 2. identify next hop, 3. Select services. The table lists services with columns for IP Address, Host Name, Service, and Status.

IP Address	Host Name	Service	Status
100.128.173.87	meridian-1	HTTP	OK
100.128.173.87	meridian-1	HTTP	OK
172.17.0.11	meridian-1	HTTP	OK
100.128.173.100	meridian-1	HTTP	OK

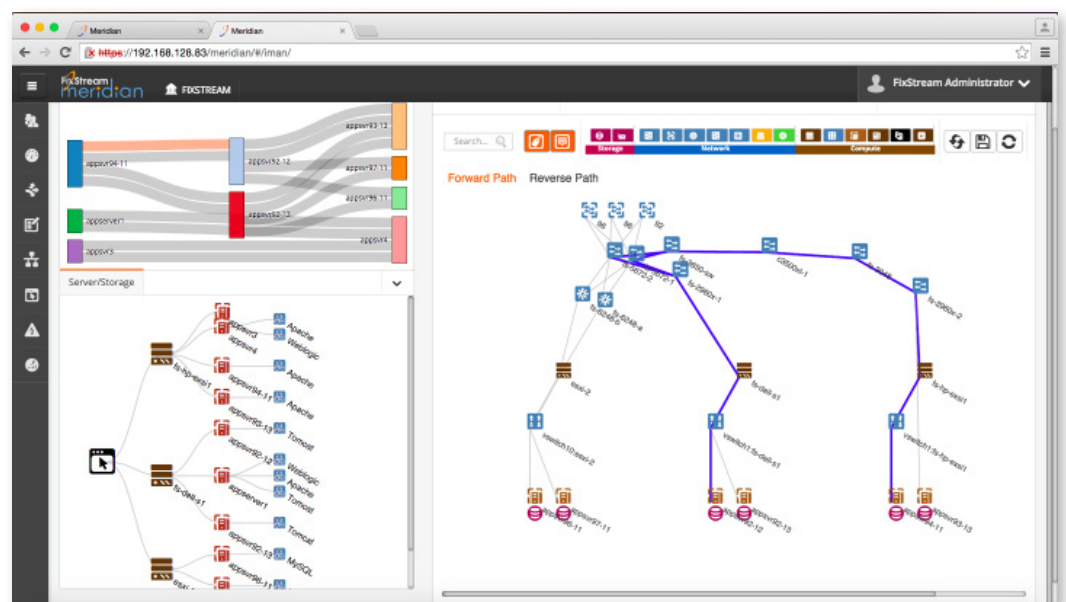
## Business Application to Business Service Mapping

After business applications are created Meridian provides a simple drag and drop “playlist” feature to further group these business applications into higher level application groups or business services which map to higher level business processes. The system then persists these higher-level groups over time for holistic visualization and troubleshooting.



## Integrated Map of Application and Infrastructure

Meridian builds an integrated map for each business application showing how all the underlying application and infrastructure service components roll up underneath. This integrated map shows the association between physical and virtual components, flows and paths, capacity, performance and metrics for each. Additional layers of contextual information like alerts and faults can be selectively placed on top of each map to enable cross-domain and collaborative troubleshooting and planning.



Integrated Map of Application and Infrastructure



**FixStream, Inc.**  
**2680 North First Street**  
**San Jose, CA, USA**

[www.FixStream.com](http://www.FixStream.com)

© 2015 FixStream Inc.  
All Rights Reserved.

**Contact Us:**

FixStream is excited to be working with visionary technology and channel partners and customers. We invite you to contact us and experience the next level of visibility in your data center.

**Email: [info@fixstream.com](mailto:info@fixstream.com)**