

NEXT
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LEAD WHAT'S NEXT

Building scalable service-based applications... *Wicked Fast*

Using Lumada Foundry to build Hitachi Content Intelligence

Jonathan Chinitz

Product Manager, Content & Data Intelligence

September 2017

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**So...What's the
big deal?**



Why?

- Composability
- Reusability
- Flexibility
- Focus
- Agility
- Time to Market

“The ability to build new things from existing pieces” [Pratt, 1999]

“...it takes a lot of time to maintain and modify a design that can adapt when external changes occur” [Wikipedia]

“Reusability implies more explicit requirements and more explicit dependencies, such as packaging, installation, configuration, deployment, maintenance and upgrade issues. If these issues are not considered, software may appear to be reusable from design point of view, but will not be reusable in practice” [Wikipedia]

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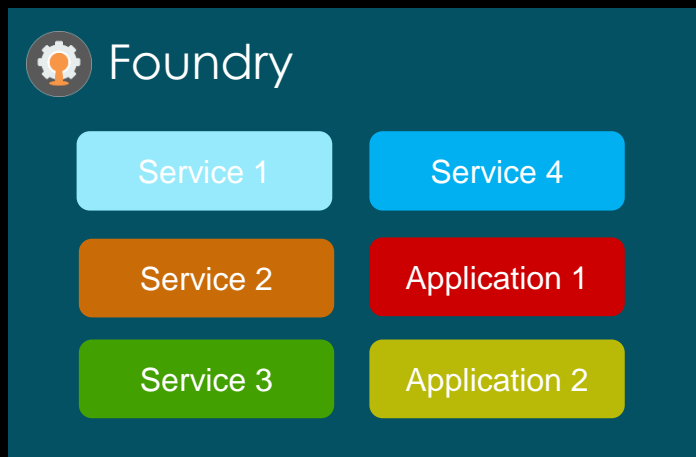
Lumada Foundry



What is Foundry?

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A platform for the rapid development of service-based applications

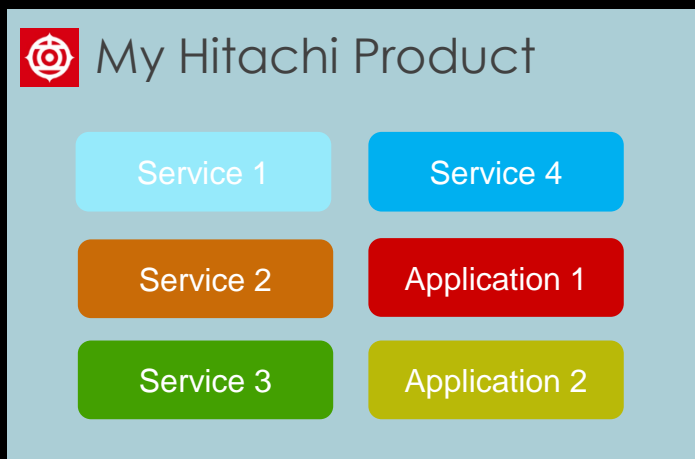


Used to build, compose, package, and run enterprise products

What is Foundry?

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A platform for the rapid development of service-based applications

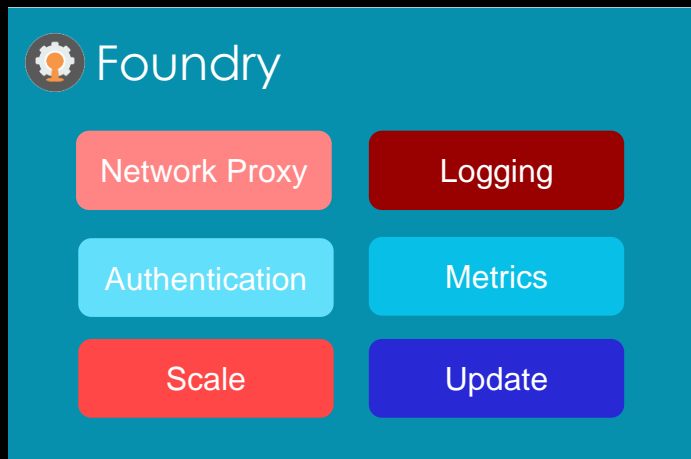


Used to build, compose, package, and run enterprise products

What is Foundry?

NEXT
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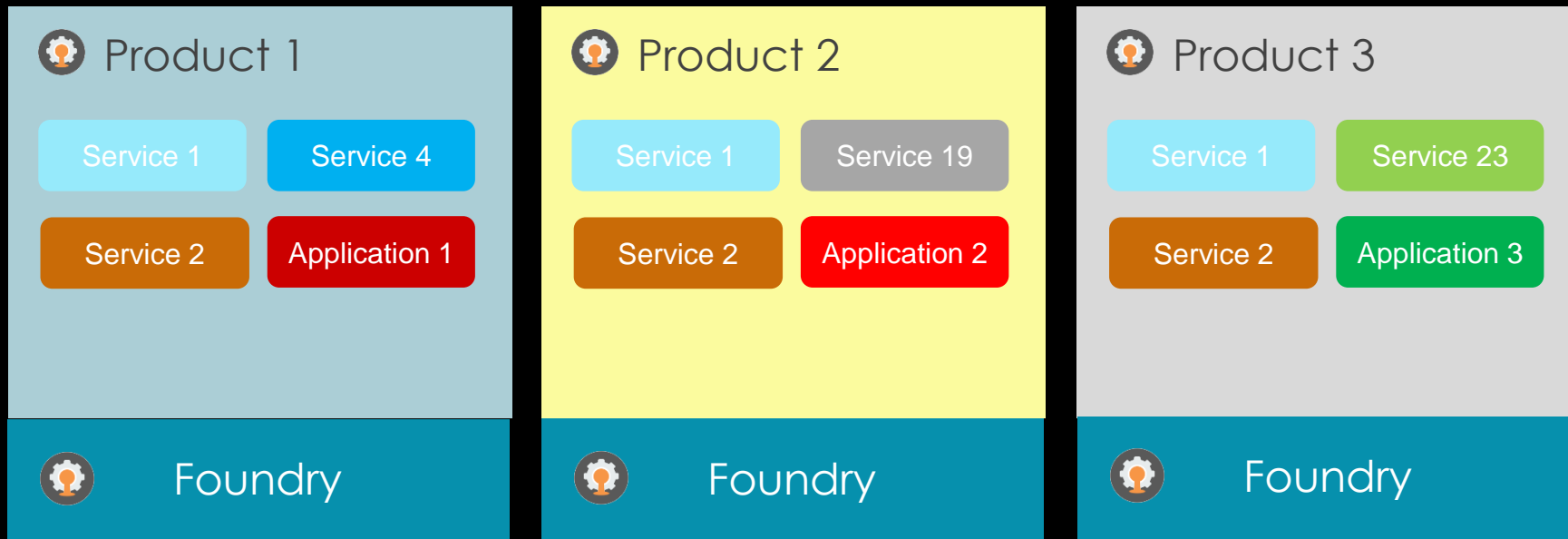
Foundry provides the common infrastructure



Keeping the focus on the solution, not technology hurdles

Why Foundry?

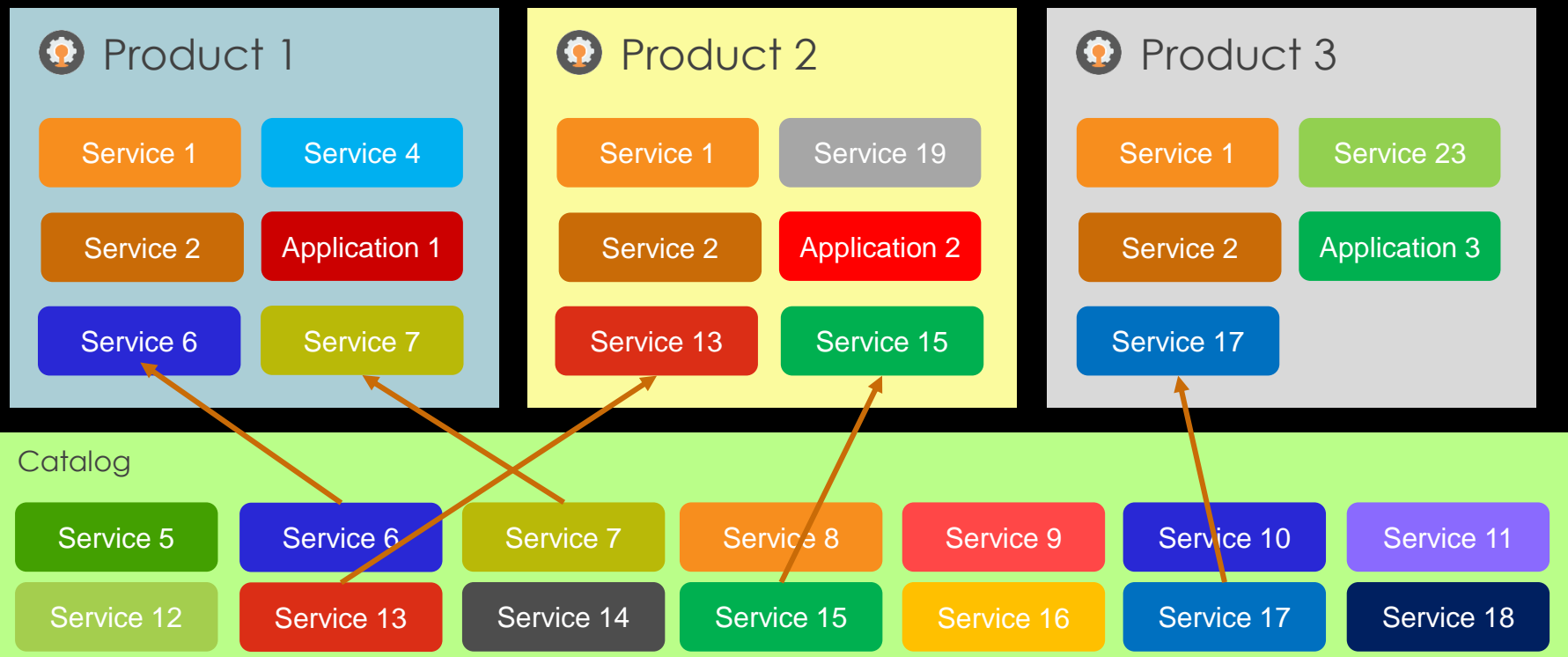
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Build flexible enterprise grade solutions - *faster*

Why Foundry?


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Build and leverage an expanding catalog of services and plugins

Why Foundry?


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 Product 1

Service 1	Service 4
Service 2	Application 1
Service 6	Service 7

 Product 2

Service 1	Service 19
Service 2	Application 2
Service 13	Service 15

 Product 3

Service 1	Service 23
Service 2	Application 3
Service 17	

Customize, Package, Deliver

Why Foundry?

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Health Care

Service 1

Service 4

Service 2

Application 1

Service 6

Service 7



Transportation

Service 1

Service 19

Service 2

Application 2

Service 13

Service 15



Financial

Service 1

Service 23

Service 2

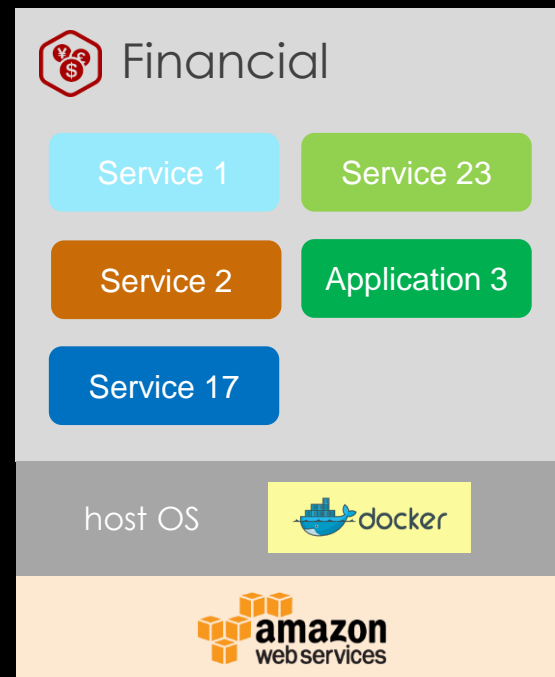
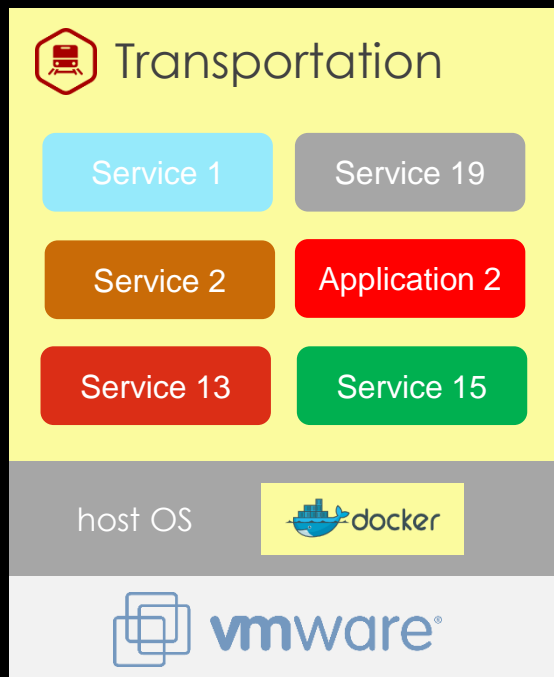
Application 3

Service 17



Why Foundry?

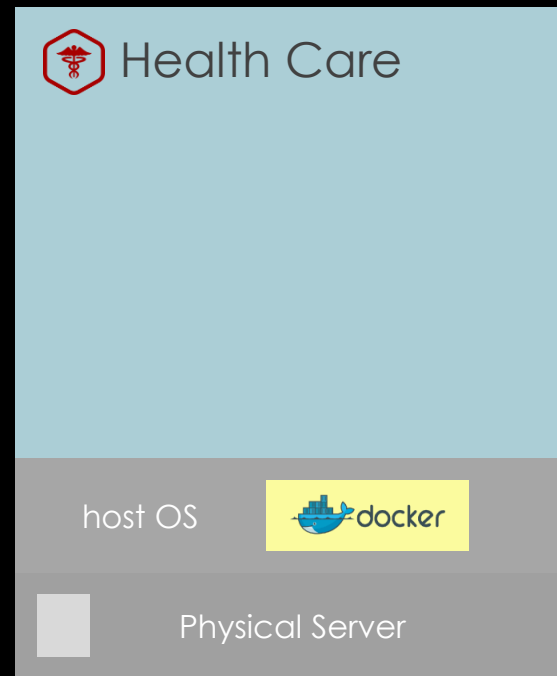
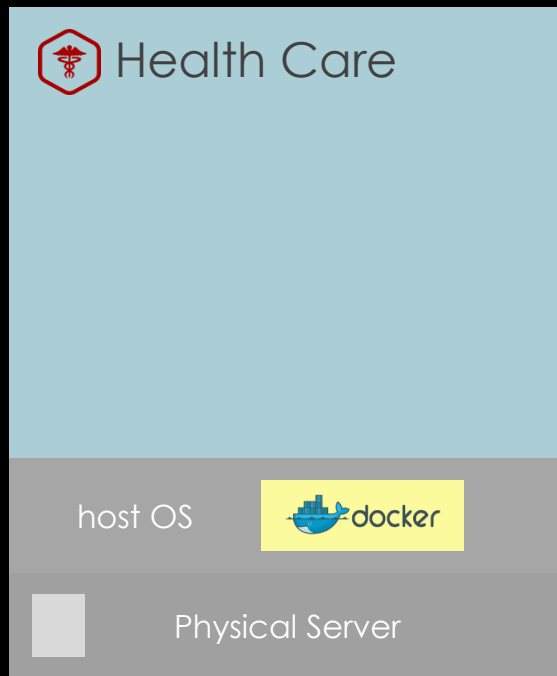
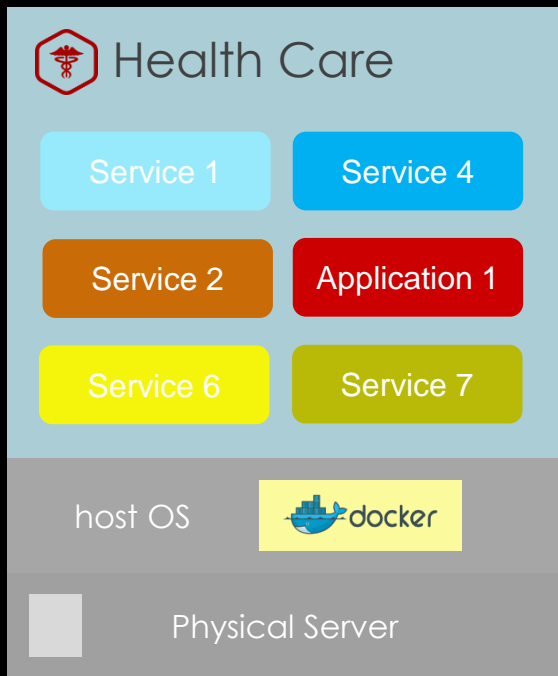
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Deploy consistently in physical, virtual, and cloud environments

Why Foundry?

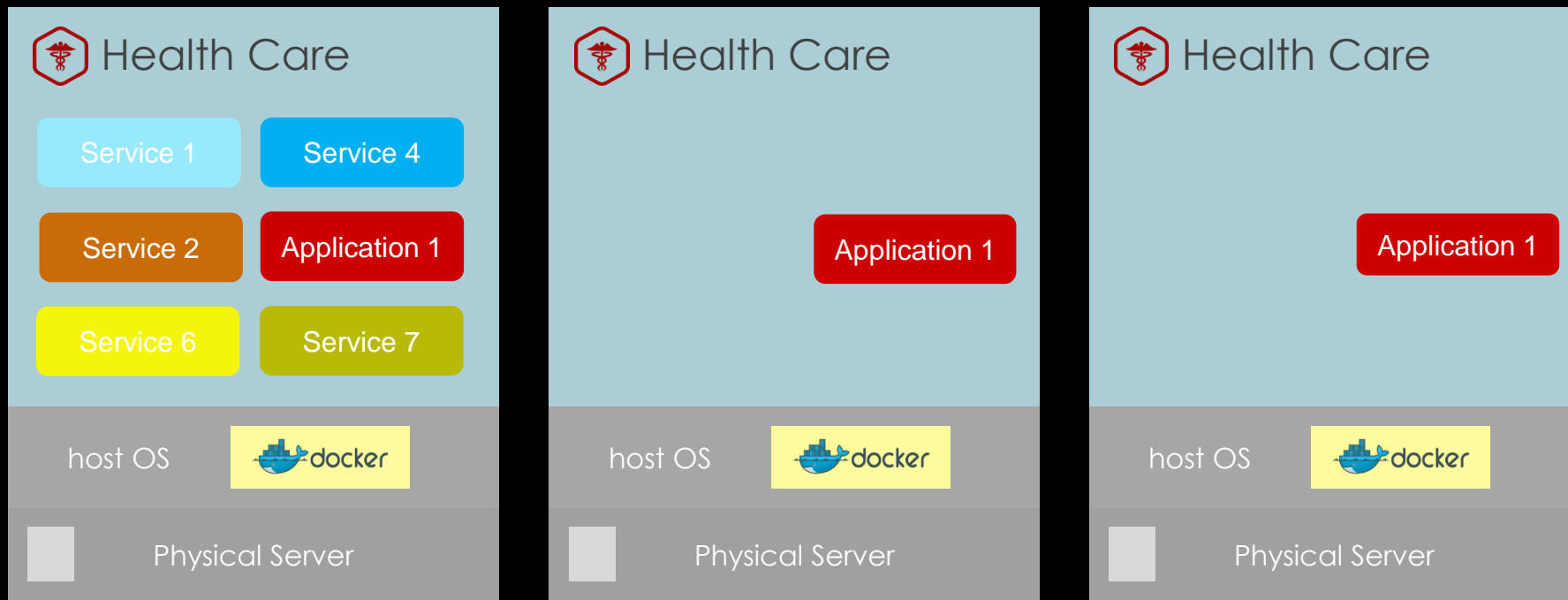
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Seamlessly deploy and scale clustered systems

Why Foundry?

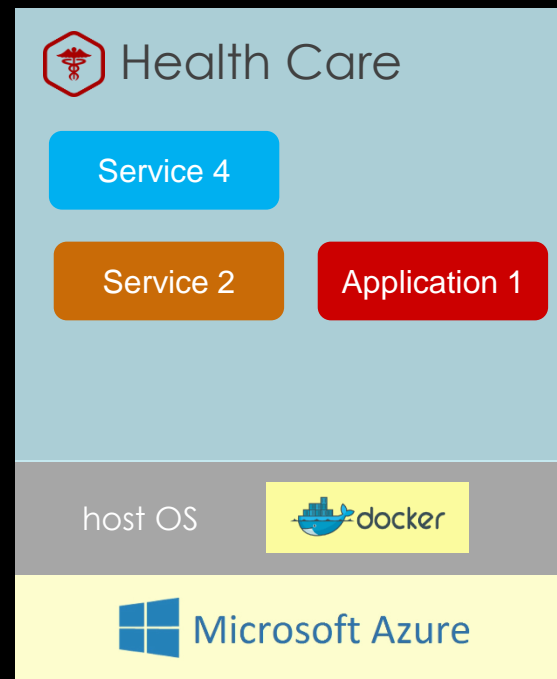
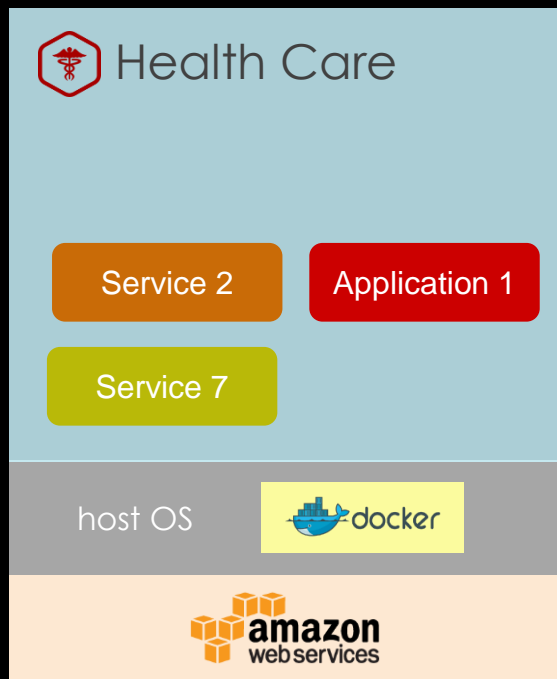
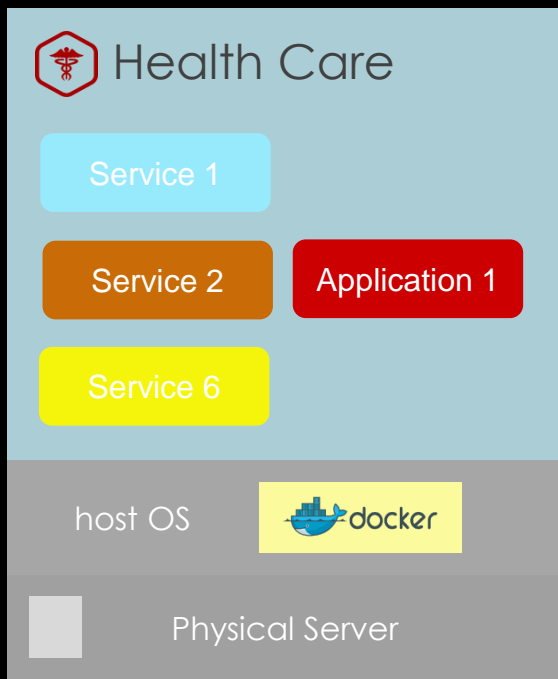
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Scale and load balance services

Why Foundry?

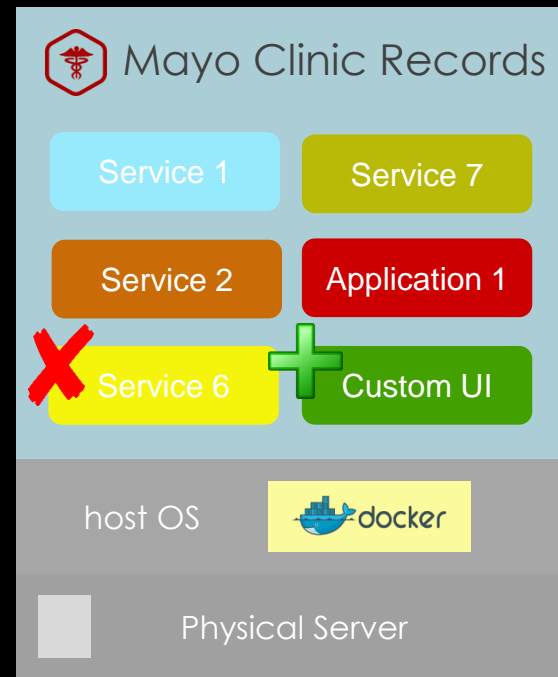
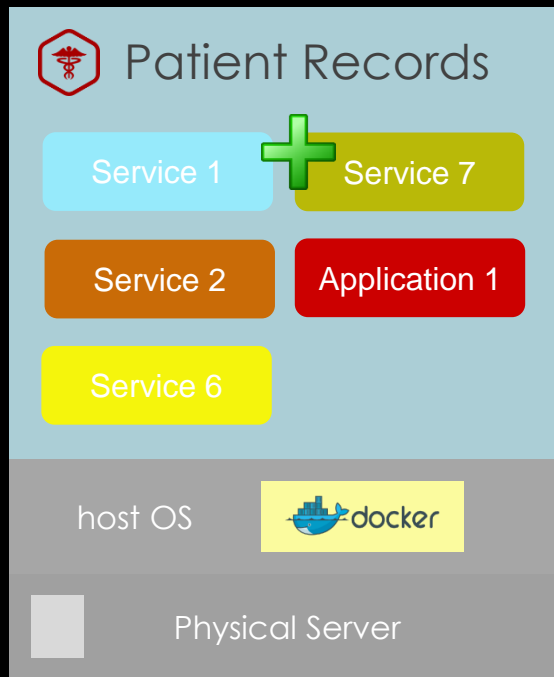
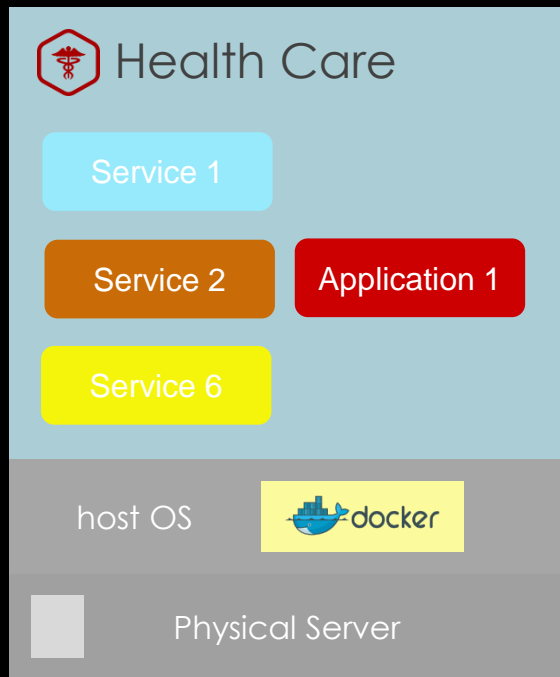
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Hybrid deployments can be used to distribute load

Why Foundry?

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Every Foundry-based product is also a Foundry

Foundry Platform Features

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Foundry

Service SDK & Test Harness

Branding

Scale-out / Clustering

Business Object Management

Deployment

Authentication / Authorization

Monitoring / Logging / Metrics

Clustered Filesystem

Persistence Services

Data Connectors

Packaging

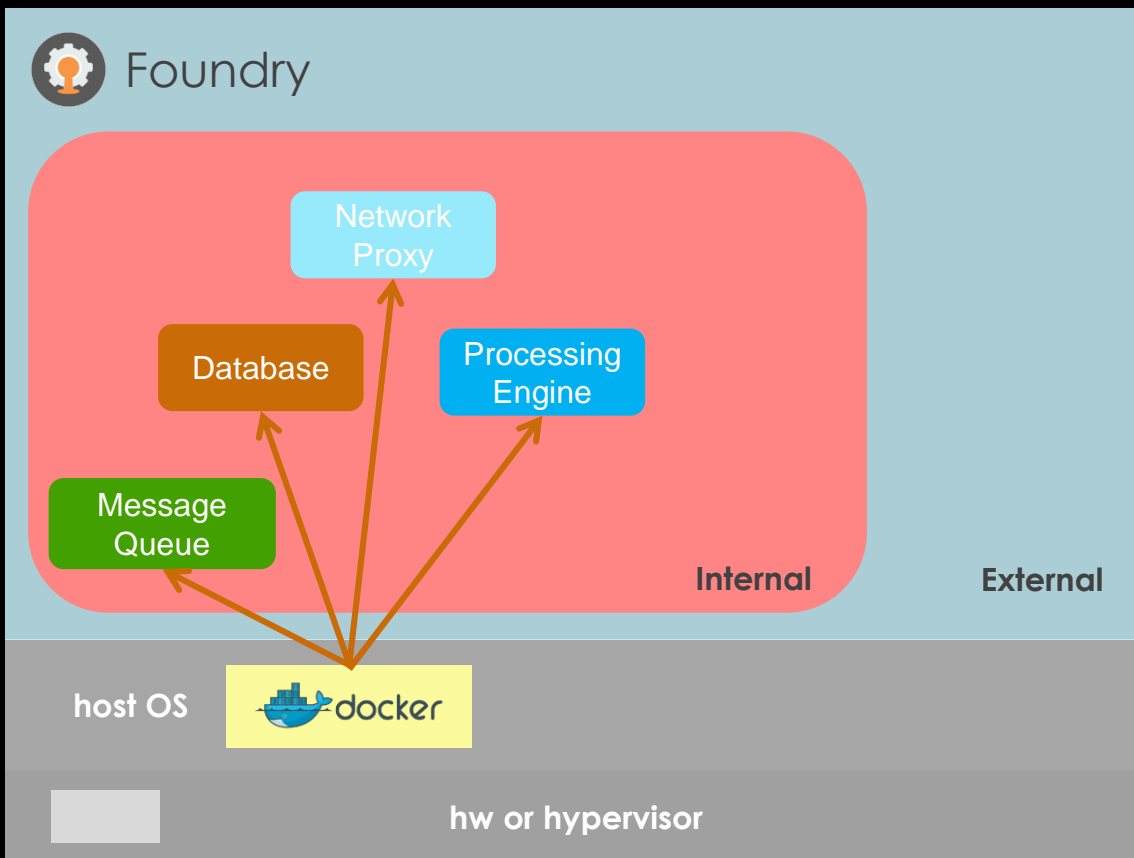
Update Framework

Network Proxy

And much more ...

What is a Service?

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A **Service** is one or more containerized processes running in the Foundry.

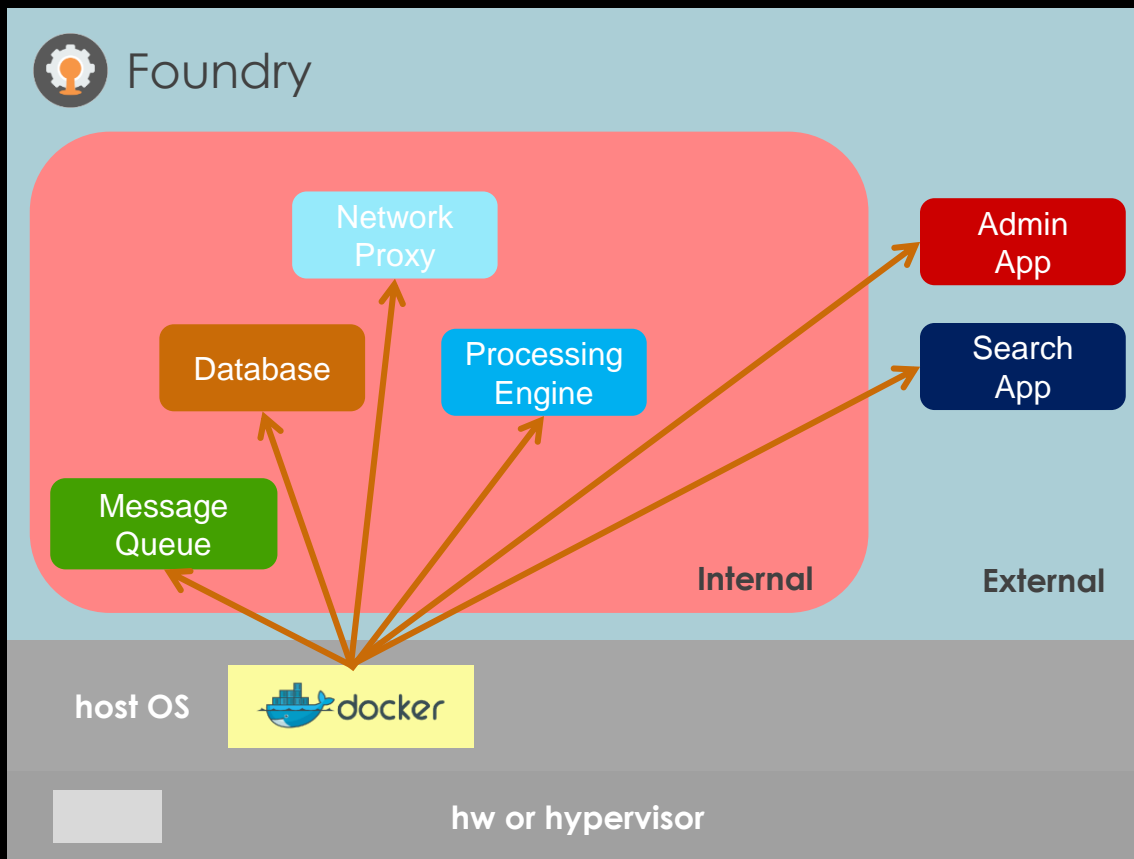
Services are individually deployable and provide a single capability.

Many services are internal components, and may not be used directly by end users.

Can be proprietary, or open source.

What is an Application?

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Applications are services exposed outside the cluster.

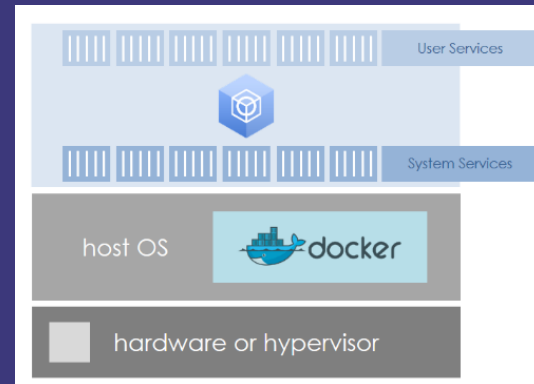
These services provide end-user access to publicly facing **UI**, **CLI**, and **APIs**.

They are typically secured to **authenticated** users and are not generally used by code within the cluster.

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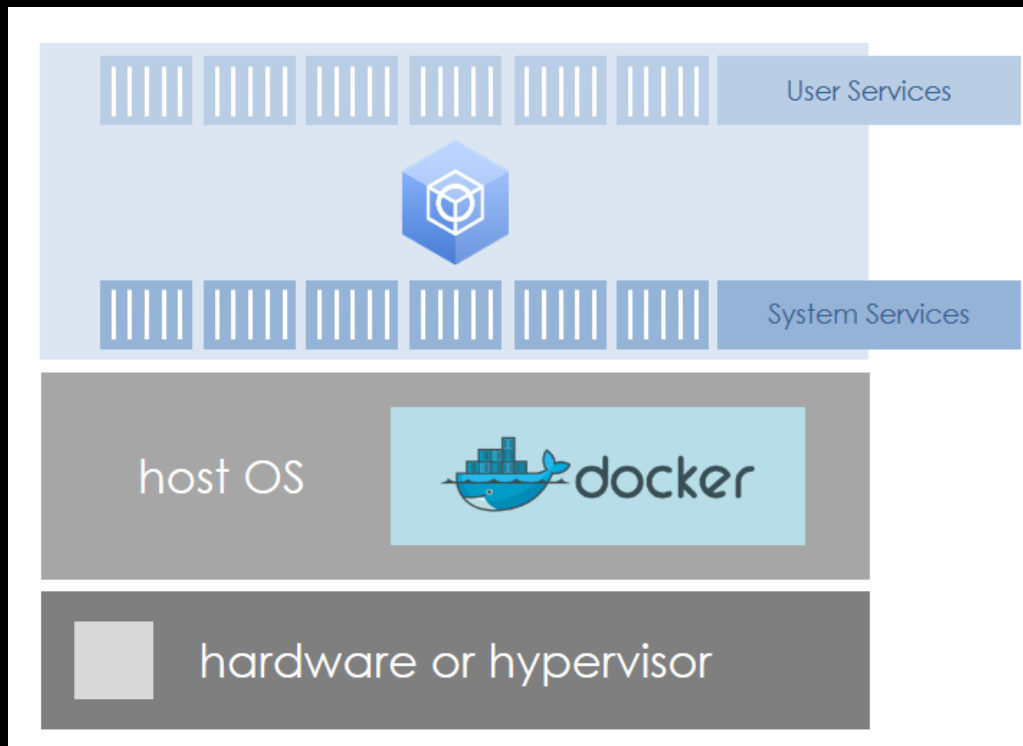
LEAD WHAT'S NEXT

Foundry Instances and Clusters



Foundry Instance

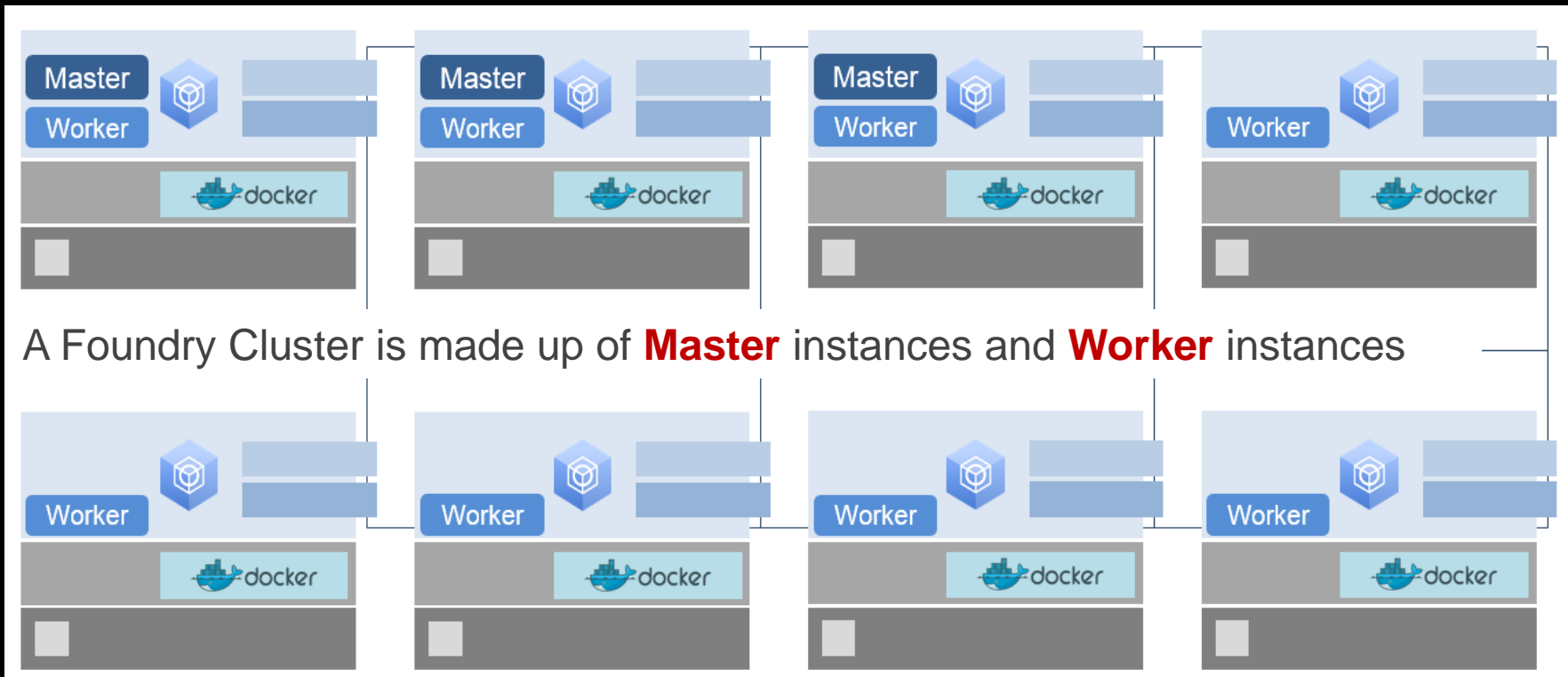
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A **Foundry Instance** is a machine (server or node) running a collection of Foundry services

Foundry Cluster

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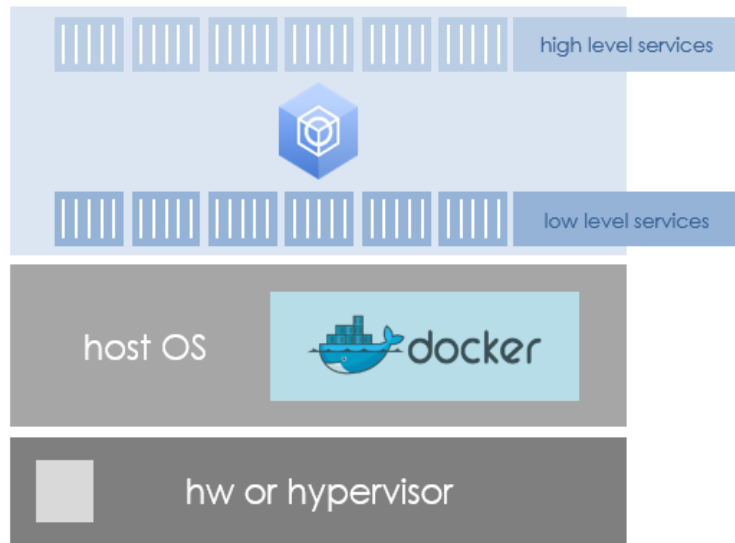


A Foundry Cluster is made up of **Master** instances and **Worker** instances

A **Foundry Cluster** is a collection of Foundry Instances

Sample Instance

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High Level Services (apps)

Applications

Search app

Persistent services

dashboard

database

index

message queue

metrics

workflow agent

Low Level Services (infrastructure)

Master instance role

admin app

cluster coordination

service deployment

synchronization

Single instance

scheduling

logging

sentinel

All instances

cluster worker

network proxy

job driver

watchdog

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Foundry Monitoring and Alerting



Foundry Cluster Monitoring

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Services	Total CPU	Total Memory	Total Disk
7 of 8	10% of 16 CPUs	27.5 GB of 62.7 GB	15.6 GB (711.3 GB Free)

Instances

Masters	State	Load Avg	CPU	Memory	Disk
172.18.108.102	Up	0.06 / 0.11 / 0.14	11% of 4 CPUs	8.0 GB of 15.7 GB	4.3 GB (176.6 GB Free)
172.18.108.106	Up	0.01 / 0.05 / 0.07	14% of 4 CPUs	8.2 GB of 15.7 GB	5.1 GB (177.9 GB Free)
172.18.108.114	Up	0.25 / 0.18 / 0.14	4% of 4 CPUs	6.6 GB of 15.7 GB	3.2 GB (176.4 GB Free)
Workers			CPU	Memory	Disk
1 of 1			11% of 4 CPUs	4.7 GB	2.9 GB (180.4 GB Free)

Services

Warning: 1 of 8 services are currently unhealthy.

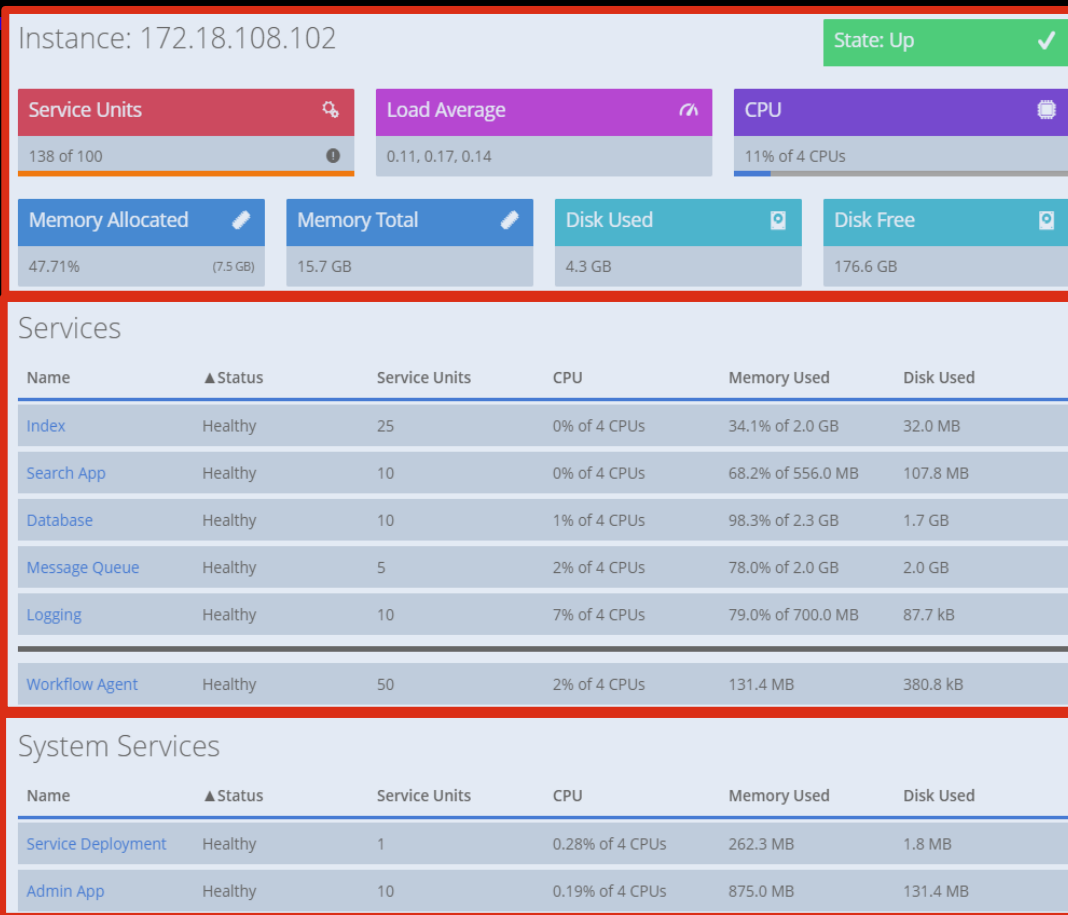
Status	Count	CPU	Memory	Disk Used
Healthy	7	7% of 16 CPUs	16.3 GB	14.1 GB
Unconfigured	1	0% of 16 CPUs	0	0

Foundry Monitoring can be done at a variety of levels

Cluster metrics

Foundry Instance Monitoring

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Instance metrics

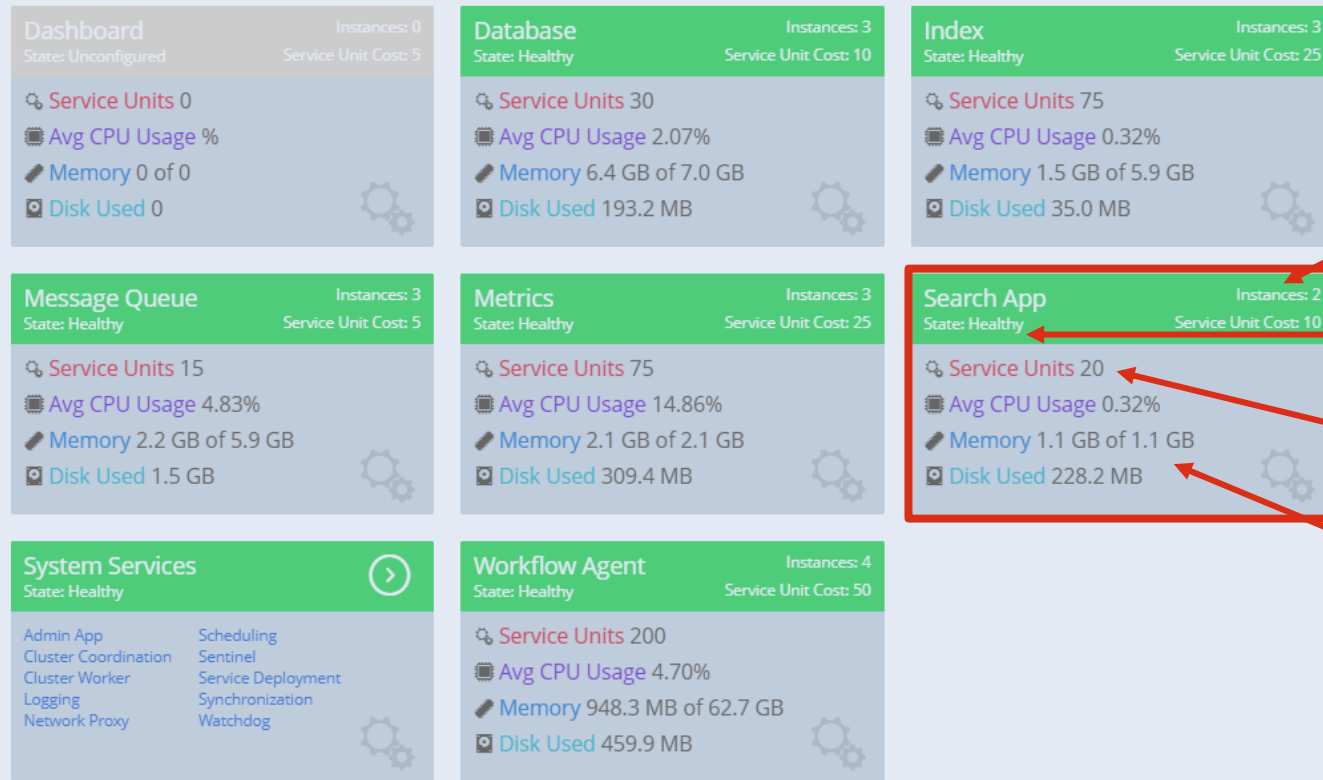
Instance services

Instance system services

Foundry Services Monitoring

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Services



Foundry
services metrics

No. of instances

State

Cost

Usage

Foundry Individual Service Monitoring

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Service: Index

Service Unit Cost	Avg CPU Usage	Memory	Disk Used
25	0.08%	1.5 GB of 5.9 GB	35.0 MB

Service Properties

Enron	Documents
Healthy	Healthy

Foundry service metrics

Instances

Search

Host Address	Health	CPU	Memory	Disk Used
172.18.108.106	Healthy	0.08% of 4 CPUs	564.0 MB of 2.0 GB	4.2 MB
172.18.108.102	Healthy	0.10% of 4 CPUs	599.8 MB of 2.0 GB	30.8 MB
172.18.108.118	Healthy	0.06% of 4 CPUs	380.1 MB of 2.0 GB	2.9 kB

Page: 1 of 1 | Items: 10 | First < 1 > Last

Foundry Service instances

Events

Date	Severity	User	Message
MM/dd/yyyy HH:mm	All	All	All
07-24-2017 10:01:40 -0400	INFO	system	Issue with Services Index resolved
07-24-2017 09:58:41 -0400	WARNING	system	Service Index under-protected
07-24-2017 09:58:22 -0400	INFO	admin	Edited Service "Index"
07-24-2017 08:03:14 -0400	INFO	system	Created Service "Index"

Page: 1 of 1 | Items: 10 | First < 1 > Last

Foundry service events

Foundry System Events

NEXT
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Date	Severity	User	Message	111 Events
<input type="text" value="MM/dd/yyyy HH:mm"/>	<input type="text" value="All"/> ▾	<input type="text" value="All"/>	<input type="text" value="All"/> <input type="button" value="Search Q"/>	
07-25-2017 08:07:52 -0400	INFO	system	User admin authenticated	
Message User admin authenticated				
Description User admin with Id 97f2a5da-193a-415d-ac03-f111715d8251 authenticated successfully to the Administration App.				
Details ID: 5010 Username: system Subsystem: User				
07-24-2017 18:33:10 -0400	WARNING	system	Workflow task Index HCP Documents MQE finished with failur...	
07-24-2017 18:30:10 -0400	INFO	system	Workflow task Index Enron Emails finished	
07-24-2017 18:28:10 -0400	INFO	admin	Workflow task "Index HCP Documents" cleared	
07-24-2017 18:28:07 -0400	INFO	system	Workflow task "Index HCP Documents MQE" started	
07-24-2017 18:27:58 -0400	INFO	system	Workflow task "Index Enron Emails" started	
07-24-2017 18:27:57 -0400	INFO	system	Workflow task "Index HCP Documents" started	
07-24-2017 18:27:15 -0400	INFO	system	Created Task "Index Enron Emails"	
07-24-2017 18:27:15 -0400	INFO	system	Imported Workflow "Index Enron Emails"	
07-24-2017 18:27:15 -0400	INFO	system	Created Task "Index HCP Documents MQE"	

Page: 1 of 12 | Items: 10 ▾

Foundry system events
Are searchable by date,
severity, user, and
message type

Foundry alerts

The screenshot displays the Foundry Alerts interface. At the top left, the word "Alerts" is shown next to a close button (X). Below this, a notification bar shows a bell icon, the number "1", and a warning icon, followed by the timestamp "Jun 15, 2017 11:07 AM". A search bar labeled "Filter alerts" and a "Clear Filter" button are positioned below the notification bar. The main alert area contains a "WARNING" message with the code "[6002]" and the text "Service Database under-protected" and "Service Database is under-protected.", dated "Jun 15, 2017 11:06:49 AM".

NEXT
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LEAD WHAT'S NEXT

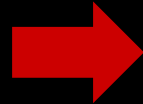
Foundry Security



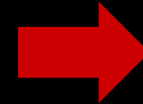
Foundry Authentication / Authorization

NEXT
2017

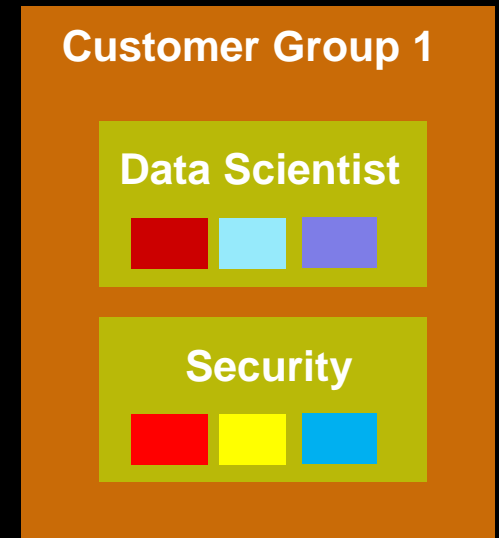
Permissions



Roles



Groups



Foundry Authentication / Authorization

NEXT
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Plugin Bundles All Plugins Aggregates Connectors **Identity Providers** Indexers Notifiers Stages [Reload Plugins](#)

Search

▲ Name	Type	Category	Description
389 Directory Server	Identity	LDAP	Interface to 389 Directory Servers
Active Directory (LDAP)	Identity	LDAP	Interface to Active Directory servers using LDAP
LDAP Compatible	Identity	LDAP	Interface to generic LDAP identity providers
OpenLDAP	Identity	LDAP	Interface to OpenLDAP directory servers

Page: 1 of 1 | Items: 10 ▼ [First](#) < 1 > [Last](#)

Many system components are pluggable, including Identity Providers

Add Identity Provider

Type

Active Directory (LDAP)

Security Realm Name

HDS LDAP

This name is displayed as a Security Realm option on the login screen. Tip: Use a name that your users will recognize.

Description

This security realm is used to connect users from the Hitachi Data Systems LDAP system

Identity Provider description (optional)

Connection

Identity Provider Hostname

172.18.100.81

Connection string used to communicate with the identity provider (e.g., "provider.example.com").

Transport Security

None

TLS Security

SSL

The protocol to use for securing communications with the identity provider.

Identity Provider Host Port

389

Network port used to communicate with the identity provider. The default value is either 389 or 636, depending on the value for the Transport Security setting.

User Name

Active Directory (LDAP)

Description

Interface to Active Directory servers using LDAP

Details

<http://www.microsoft.com>

You can configure a Active Directory (LDAP) identity provider to:

- Connect to an Active Directory server using the LDAP/S protocol.
- Find group accounts to map into the system.
- Determine group membership for individual users.

Configure an **Identity Provider** to build a Security Realm

Foundry Authentication / Authorization

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Add Group

Step 1 of 3: Select Identity Provider

Identity Provider

Active Directory

Identity Provider Query Filter (Optional)

Ens*

Optional query string used to filter results from the Identity Provider. Leave this field empty to query all groups.

Discover Groups

Step 2 of 3: Select Identity Provider Group

Search

▲ Name	Domain	Distinguished Name	
EnsAdmins	ENSEMBLEAD.ARCHIVAS.COM	CN=EnsAdmins,CN=...	+
EnsAllUsers	ENSEMBLEAD.ARCHIVAS.COM	CN=EnsAllUsers,CN=...	+
EnsembleUsers	ENSEMBLEAD.ARCHIVAS.COM	CN=EnsembleUsers...	+
EnsMarketingUsers	ENSEMBLEAD.ARCHIVAS.COM	CN=EnsMarketingU...	+
EnsSearchUsers	ENSEMBLEAD.ARCHIVAS.COM	CN=EnsSearchUsers...	+
EnsSuperUsers	ENSEMBLEAD.ARCHIVAS.COM	CN=EnsSuperUsers,...	+

Page: 1 of 1 | Items: 10 | First < 1 > Last

Register **groups** from the Identity Provider

Foundry Authentication / Authorization

NEXT
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Edit permissions:

Search

- > Alerts (1 of 1) Yes
- > Certificates (4 of 4) Yes
- > Content Classes (4 of 4) Yes
- ▼ Data Sources (5 of 6) Yes

Search

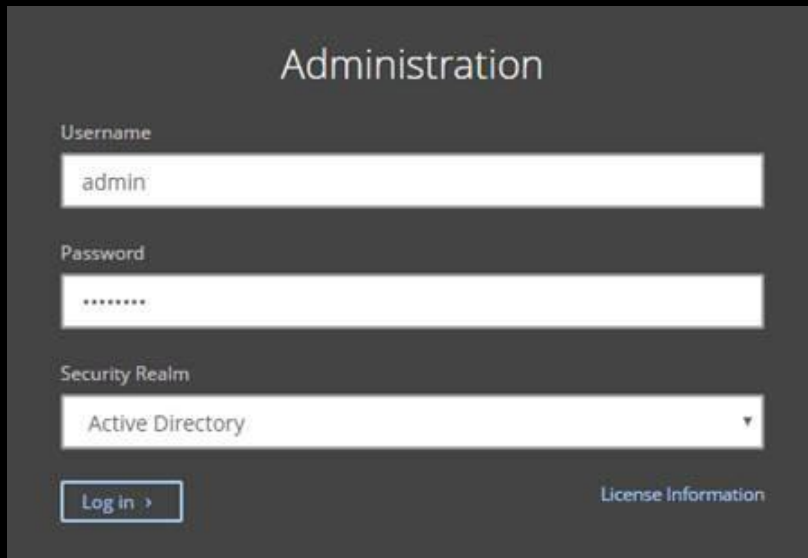
Permission	Description	Selected
admin:datasources:read	Read a datasource(s)	<input checked="" type="checkbox"/>
admin:datasources:update	Update a datasource	<input checked="" type="checkbox"/>
admin:datasources:delete	Delete a datasource	<input checked="" type="checkbox"/>
admin:datasources:create	Create a datasource	<input checked="" type="checkbox"/>
admin:datasources:browse:create	Browse a datasource	<input checked="" type="checkbox"/>
admin:datasources:data:create	Push data into a datasource	<input type="checkbox"/>

Choose **permissions** to build custom **roles**.

Assign one or more roles to groups.

Foundry Authentication / Authorization

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The screenshot shows a login interface for the Foundry Administration. It features a dark gray background with white text and input fields. The title 'Administration' is centered at the top. Below it, there are three input fields: 'Username' with the value 'admin', 'Password' with masked characters '*****', and 'Security Realm' with a dropdown menu showing 'Active Directory'. At the bottom left is a 'Log in >' button, and at the bottom right is a link for 'License Information'.

Log into any available **security realm**, with single sign on.

Users are granted permissions from the groups they belong to.

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Foundry Service Management



Foundry Service Management

NEXT
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Plugins

Services

Instances

Security

Certificates

Notifications

License

Packages

Update

Manage Services Wizard

Step: 1 Select Service Step: 2 Select Action Step: 3 Configure

Select a Service

Select a service below that you would like to modify:

Service Units in Use
526 of Unlimited

Dashboard Powers the advanced Dashboard Management service. Service Unit Cost: 5 Instances: 0 Total in Use: 0	Database Stores system configuration data and document fields and values. Service Unit Cost: 10 Instances: 3 Total in Use: 30	Index <input checked="" type="radio"/> Manages all HCI internal search indexes. Service Unit Cost: 25 Instances: 3 Total in Use: 75
Message-Queue Facilitates communication between HCI instances. Service Unit Cost: 5 Instances: 3 Total in Use: 15	Metrics Manages system events and workflow performance and failure data. Service Unit Cost: 25 Instances: 3 Total in Use: 75	Search-App Powers the Search App. Service Unit Cost: 10 Instances: 2 Total in Use: 20
Workflow-Agent Service used for running workflows. Service Unit Cost: 50 Instances: 4 Total in Use: 200		

Instances running the Index Service

172.18.108.102 Master Status: Up	172.18.108.106 Master Status: Up	172.18.108.118 Worker Status: Up
--	--	--

Cancel < Previous Next > Add to Queue ⇄ ☰

Foundry Service Management

NEXT
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Manage Services Wizard



Step: 1
Select Service



Step: 2
Select Action



Step: 3
Confirm

Select Action

Select the action below that you would like to perform:

Configure

Configure general and/or service-specific settings



Repair

If a service is unresponsive, use this option to stop and then redeploy it



Scale

Reconfigure this service on to run on more, fewer, or different instances



Cancel

< Previous

Next >

Add to Queue ⇌+



Foundry Service Management

NEXT
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Manage Services Wizard



Scale Index Service

Service Units in Use
526 of Unlimited

Selected Instances

The Index Service is currently running on the instance below.

▲ Instance	Services	Service Units	Load Avg	Select All
172.18.108.102	11	133	0.31	<input type="checkbox"/>
172.18.108.106	12	148	0.06	<input type="checkbox"/>
172.18.108.118	7	101	0.01	<input type="checkbox"/>

Page: 1 of 1

First < 1 > Last

Remove Instances >

Available Instance

The available instances below are eligible to run the Index Service.

▲ Instance	Services	Service Units	Load Avg	Select All
172.18.108.114	15	144	0.40	<input type="checkbox"/>

Page: 1 of 1

First < 1 > Last

< Add Instances

Cancel

< Previous

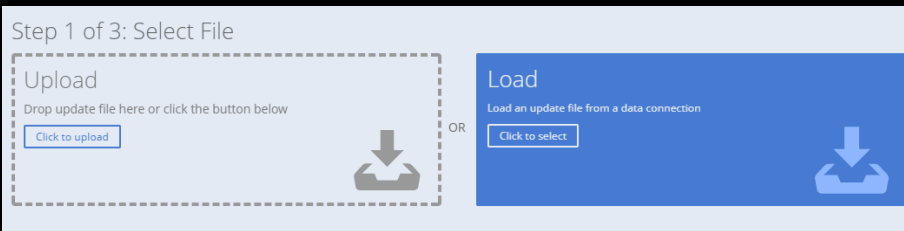
Next >

Add to Queue ⇌

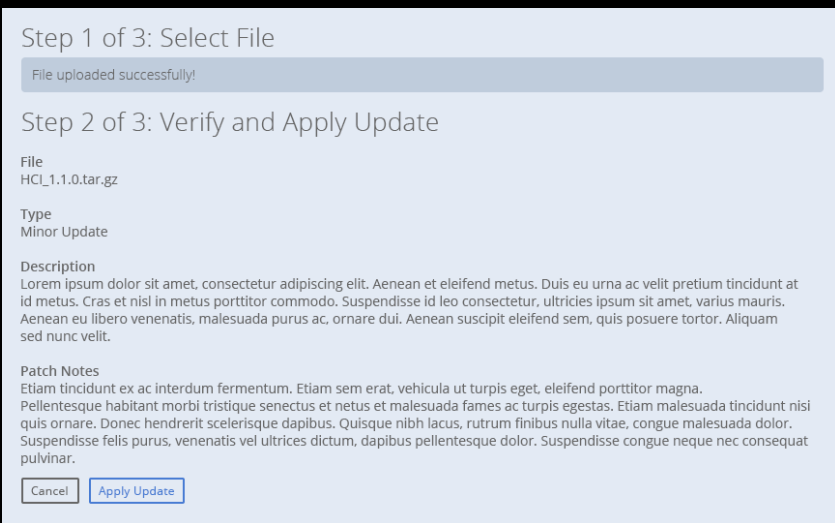
☰

Foundry Update Framework

NEXT
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Update framework integrated with Connector framework



Product-specific update framework integrates service updates

Foundry Update Framework

NEXT
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Step 1 of 3: Select File

File uploaded successfully!

Step 2 of 3: Verify and Apply Update

View update details >

Step 3 of 3: Applying Update

Performing Pre-checks

Current pre-check being performed

1 of 8

This screenshot shows the first step of the update process. The progress bar is at 1 of 8, indicating that only the first of eight pre-checks has been completed. The interface is light blue and grey.

Step 1 of 3: Select File

File uploaded successfully!

Step 2 of 3: Verify and Apply Update

View update details >

Step 3 of 3: Applying Update

Performing Pre-checks

All pre-checks completed successfully

8 of 8

Installing Update

Update completed successfully!

10 of 10

Exit

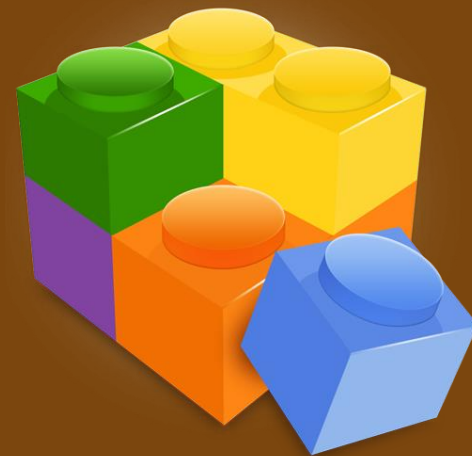
This screenshot shows the final step of the update process. The progress bar is at 10 of 10, indicating that the update is complete. The interface is light blue and grey. An 'Exit' button is visible at the bottom left.

Each product is responsible for loading, verifying, pre-checking, and applying updates

NEXT
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Plugins, Plugins, Plugins...



Foundry Plugins

NEXT
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▲Name	Type	Category	Description
389 Directory Server	Identity	LDAP	Interface to 389 Directory Servers
Active Directory (LDAP)	Identity	LDAP	Interface to Active Directory servers using LDAP
Amazon S3	Connector	Object	List-based connector for Amazon S3
Appender	Stage	Enrich	Appends field value(s) or custom text to field value(s) or stream con...
Average Aggregate	Aggregate	Aggregates	An aggregation that calculates the average of all the values for a fie...
Cache Stream	Stage	Action	Reads a specified stream into a local temp file. Subsequent reads o...
Content Class Extraction	Stage	Extract	Uses one or more content classes to extract fields from document ...
Date Conversion	Stage	Transform	Converts date field values to ISO 8601 dateTime format
DICOM Metadata Extraction	Stage	Extract	Discovers text metadata from DICOM (Digital Imaging and Commu...
Document Field Aggregate	Aggregate	Aggregates	An aggregation that keeps track of all fields encountered across all ...

Page: 1 of 6 | Items: 10 ▾

First < 1 2 3 4 5 > Last

Foundry Plugins

NEXT
2017

Plugin Bundles All Plugins Aggregates **Connectors** Identity Providers Indexers Notifiers Stages [Reload Plugins](#)

Search

▲Name	Category	Description
Amazon S3	Object	List-based connector for Amazon S3
Hadoop File System	File	Connector for accessing data in a Hadoop Distributed File System.
HCI Index JDBC	Database	Connector for accessing HCI Indexes through JDBC.
HCP	Object	List-based connector for Hitachi Content Platform namespaces
HCP Anywhere	Object	List-based connector for HCP Anywhere File Sync and Share
HCP Monitor	Custom	Connector Plugin for HCP node status information
HCP MQE	Object	Change-based connector for Hitachi Content Platform systems.
Kafka Queue	Message	Built-in Connector for accessing Apache Kafka Queue.
Local File System	File	Connector for accessing local filesystem data on the system instances.
MySQL and MariaDB JDBC	Database	Connector for accessing MySQL and MariaDB databases through JDBC.

Page: 1 of 2 | Items: 10 ▾ [First](#) < 1 2 > [Last](#)

Foundry Plugins

NEXT
2017

▲Name	Category	Description
Appender	Enrich	Appends field value(s) or custom text to field value(s) or stream contents.
Cache Stream	Action	Reads a specified stream into a local temp file. Subsequent reads of the stream use the local te...
Content Class Extraction	Extract	Uses one or more content classes to extract fields from document contents.
Date Conversion	Transform	Converts date field values to ISO 8601 dateTime format
DICOM Metadata Extraction	Extract	Discovers text metadata from DICOM (Digital Imaging and Communications in Medicine) image ...
Document Security	Enrich	Applies access control list (ACL) fields to documents. Used to limit search-user access to individu...
Drop Documents	Filter	Any documents sent to this stage will be dropped from the pipeline and no longer processed.
Email Expansion	Transform	Expands email (.eml/.msg) files into multiple documents (their multiple parts and attachments)
Email Notification	Action	Sends an email notification for each document processed.
Execute Action	Action	Executes an action supported by another component, such as a data connection.

Page: 1 of 3 | Items: 10 ▾

First < 1 2 3 > Last

Foundry Plugins

NEXT
2017

Plugin Bundles

All Plugins

Aggregates

Connectors

Identity Providers

Indexers

Notifiers

Stages

Reload Plugins

Search



▲ Name

Category

Description

Average Aggregate

Aggregates

An aggregation that calculates the average of all the values for a field.

Document Field Aggregate

Aggregates

An aggregation that keeps track of all fields encountered across all documents.

File Extension Aggregate

Aggregates

An aggregation that keeps count of unique file extensions.

Long Sum Aggregate

Aggregates

An aggregation that calculates the sum of all values for a field.

Maximum Aggregate

Aggregates

An aggregation that calculates the maximum value for a field.

Minimum Aggregate

Aggregates

An aggregation that calculates the minimum value for a field.

String Count Aggregate

Aggregates

An aggregation which keeps count of unique values of the document field specified.

Page: 1 of 1

Items: 10

First

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Last


Foundry Plugins

NEXT
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Plugin Bundles					All Plugins		Aggregates		Connectors		Identity Providers		Indexers		Notifiers		Stages		Reload Plugins	
Search																				
▲ Bundle Name					Version		Status		Description											
›					Aggregates		1.2.0		Active		Aggregate Plugins									
›					Amazon Web Services		1.2.0		Active		Amazon Web Services Plugin Bundle									
›					Builtin Pipeline Stages		1.2.0		Active		A set of builtin pipeline stage plugins									
›					Cassandra		1.2.0		Active		Cassandra service									
›					Chronos		1.2.0		Active		Chronos service									
›					DICOM Stage		1.2.0		Active		DICOM standard stage plugin									
›					Elasticsearch		1.2.0		Active		Elasticsearch Index Plugin									
›					Elasticsearch		1.2.0		Active		Elasticsearch service									
›					Email Notifier		1.2.0		Active		Email Notification Plugin									
›					Extract Stages		1.2.0		Active		A set of extraction pipeline stage plugins									

Foundry Plugins

NEXT
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▲ Bundle Name	Version	Status	Description
▼ Filesystem Connectors	1.2.0	Active	Filesystem Connector Plugins
Plugin Name	Type	Category	Description
Local File System	Connector	File	Connector for accessing local filesystem data on the system instan...
Hadoop File System	Connector	File	Connector for accessing data in a Hadoop Distributed File System.
> Geo-Location Stages	1.2.0	Active	A set of geo-location stage plugins
> HCP	1.2.0	Active	HCP Plugin Bundle
> HCP Monitor	1.2.0	Active	HCP Monitor Plugin Bundle 
> HDDS 3	1.2.0	Active	HDDS Index Plugin
> Identity Providers	1.2.0	Active	Builtin Identity Provider plugins
> JDBC Connectors	1.2.0	Active	JDBC Connectors Plugin Bundle
> Kafka	1.2.0	Active	Kafka service

Plugin SDK – The ultimate in Extensibility

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```
609
610
611     (jQuery);
612   /></script>
613 </head>
614 <body>
615   <div id='mainheader'>
616     <div id='header-wrapper'>
617       <div class='header-left'>
618         <:section class='header' id='header' maxwidgets='1' showaddelement='no'>
619           <:widget id='Header1' locked='true' title='My Blogger Lab (Header)'
620           type='Header'></:widget>
621         </:section>
622       </div>
623     <div class='header-right'>
624       <ul class='right'>
625         <li>
626           <a class='current' href='//blog'>
627             Blog
628           </a>
629         </li>
630         <li>
631           <a href='http://www.mybloggerlab.com/search/label/Beginners%20Guide?
632           max-results=10'>
633             Beginners%59: a Guide
634           </a>
635         </li>
636         <li>
637           <a href='http://www.mybloggerlab.com/search/label/Blogger%20Tutorials?
638           max-results=10'>
639             Tutorials
640           </a>
641         </li>
642       </ul>
643     </div>
644   </div>
645 </body>
646 </html>
```

Sample Source Code

Test/Debug them using our **Test Harness**.



HCI Plugin SDK - Build your own connectors and pipeline stages. Start with our sample source code. Incorporate your own libraries or 3rd party SDKs.

When they are ready upload them to HCI and use them in workflows.



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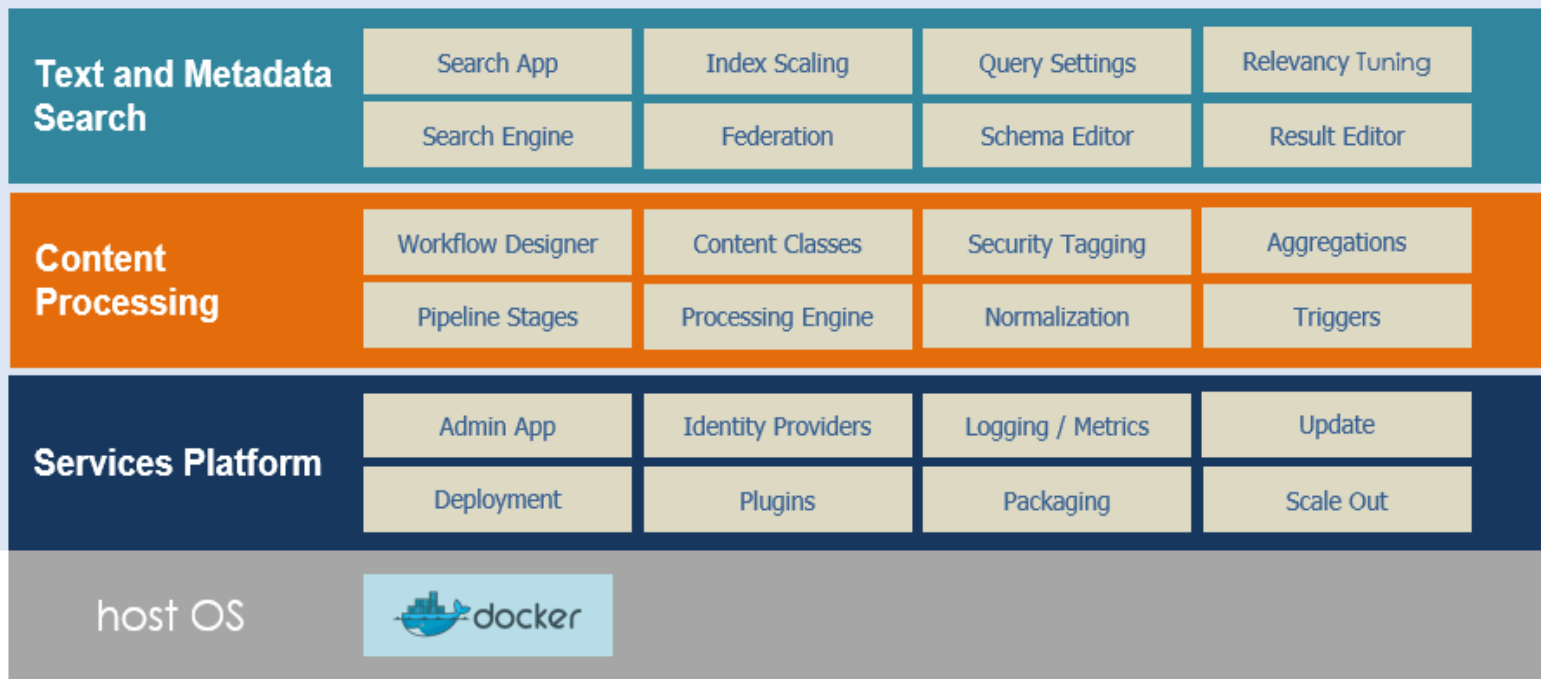
LEAD WHAT'S NEXT

Building Hitachi Content Intelligence (HCI) with Lumada Foundry





Content Intelligence





Lumada-Foundry-1.2.0.tar.gz



/bin

/config

/data

/plugins

/services



Lumada-Foundry-1.2.0.tar.gz



/bin

/config

/data

/plugins

- + solr-6.4.1-index-plugin.jar
- + hds-1.2.0-content-connector-plugins.jar

/services

- + hci-1.2.0-search-app-service.tar.gz
- + hci-1.0.0-workflow-designer-service.tar.gz
- + solr-6.4.1-service.tar.gz



HCI-1.2.0.tar.gz



/bin

/config

/data

/plugins

solr-6.4.1-index-plugin.jar

hds-1.2.0-content-connector-plugins.jar

/services

hci-1.2.0-search-app-service.tar.gz

hci-1.0.0-workflow-designer-service.tar.gz

solr-6.4.1-service.tar.gz

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YOU THINK

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