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# Migrating Data Centers

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## About this document

Data Center migrations are today not once in blue moon activity, rather you would often find migrations to be a part of your day to day routine. Migrations always come with their risks, effort and costs, but also come with their advantages and long term prospects. The document highlights some of the innovative techniques that can be adopted for DC migrations, making it easier and quick.

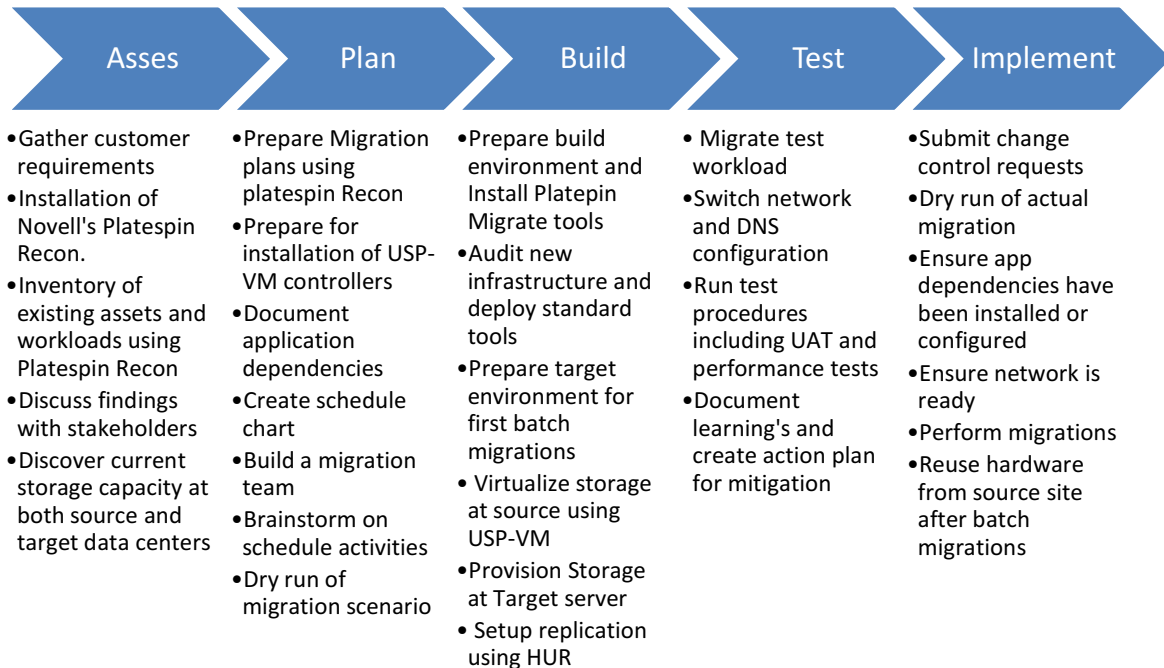
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## Methodology

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The methodology adopts the standard chevron process for assess, plan, build, test and implementation of the Data Center migration project. Details of planned activities in each phase have been provided.



We discuss each phase in some detail to gain an overview of the approach and tools used to aid migration.

### Assess

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**Approach:** Agent less discovery of Source Landscapes

**Tool:** Novell Platespin Recon

**Description:**

There are some key requirements that help in assessment of IT landscapes

- Non disruptive, agent-less tool
- Support for Heterogenous operating environments
- Single pane reporting

Our research shows that there is only one tool in the market that can offer such features- Platespin Recon from Novell. PSRecon offers agent less inventory of assets and customized reporting features. It also supports most of the workloads from Windows, Linux to even Unix systems.

While PSRecon does not have support for Amazon AWS, the usage will be limited for analysis of source workloads.

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## Plan

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**Approach:** Customized reports from PSRecon to decide on server migration Strategy

**Tool:** Novell Platespin Recon

**Description:**

The planning phase will be the most crucial one in the whole process. In this phase we will generate customized workload reports from each of the source servers and classify them into specific categories. Business Service Reviews with the customer for each of the assets will help in the classification. Size of data store will be an additional factor for categorization. The categorization would be as shown

Service Category	Data Store Levels	Description
<b>RL (Real Low)</b> Servers with low importance and lowest availability requirements.  12 hours to restore application availability with weekday downtime windows.	RL-1 DSL < 50 GB	First to move to new infrastructure in this service category, servers classified as RL and have least amount of data.
	RL-2 DSL < 300 GB	Second to move with medium sized storage requirements.
	RL-3 DSL > 300 GB	Last to move in the SC.
<b>RH (Real High)</b> Servers with medium importance and medium service availability requirements.  6 hours to restore application availability with weekend downtime window.	RH-1 DSL < 50 GB	First to move to new infrastructure in this service category, servers with classified as RH and have least amount of data.
	RH-2 DSL < 50 GB	Second to move with medium sized storage requirements.
	RH-3 DSL < 50 GB	Last to move in the SC.
<b>VH (Very High)</b> Servers with high importance and high availability requirements.  2 hours to restore application availability with small downtime window during weekends.	VH-1 DSL < 50 GB	First to move to target site in this service category, servers with classified as VH and have least amount of data.
	VH-2 DSL < 300 GB	Second to move with medium sized storage requirements.
	VH-3 DSL > 300 GB	Last to move in the SC.

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The plan phase will require creation of blueprint for migration of each batch of servers. This will include details of network, DNS, Storage, Source, Target etc.

Platespin Recon can help create migration as well as consolidation scenarios by simply choosing source and target servers. These scenarios will also include TCO savings etc to help justify the migration costs. The tool would also provide a report any possible issues that may be faced during the migration, for example the planner will be alerted if he chooses to move a 64 bit physical workload to a 32 bit VMware platform.

PSRecon reports can also help analyse used storage and storage IO requirements helping the planner decide on storage requirements at the target site.

## Build

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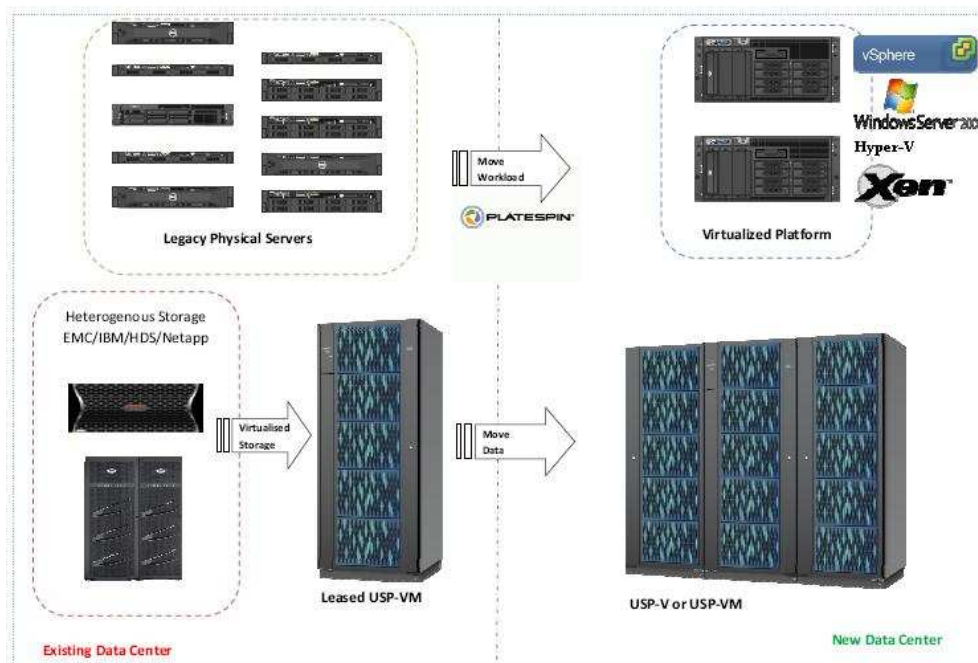
**Approach:** Build test environments on both source and target sites.

**Tools:** Platespin Migrate and USP-VM with HUR license and BOS-V license

The build phase would help us put together some of the components required. Environments would be prepared on both source and target migration sites for the test migration scenario.

The tasks would include installation of

- Installation of Platespin Migrate at source site
- Installation of USP-VM on both sites for storage virtualization
- Prepare storage for provisioning
- Prepare network and security settings to be activated for test migration



## Test

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**Approach:** Perform test migration to test connectivity, design, configuration and capture learnings.

**Tools:** Platespin Migrate and USP-VM with HUR license and BOS-V license

The test phase includes

- Selection of source server, preferably test server or RL-1 server
- Setting up target environment with required software
- Virtualizing storage at target site with USP-VM for test migration
- Provisioning of storage on target site
- If performing P2V migrations, boot of target site with Windows PE CD
- Preparing network and security settings for the migration
- Perform test migration of workload
- Capture Learnings

The test would be aimed at replicating the actual migration scenario and capturing as many learning as possible. Care should be taken to choose assets that have no association with the production environment. If possible a completely isolated test environment is the most suitable.

## Implement

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The above phases would have helped in building a good foundation for migration of the rest of the servers. The implementation phase would include

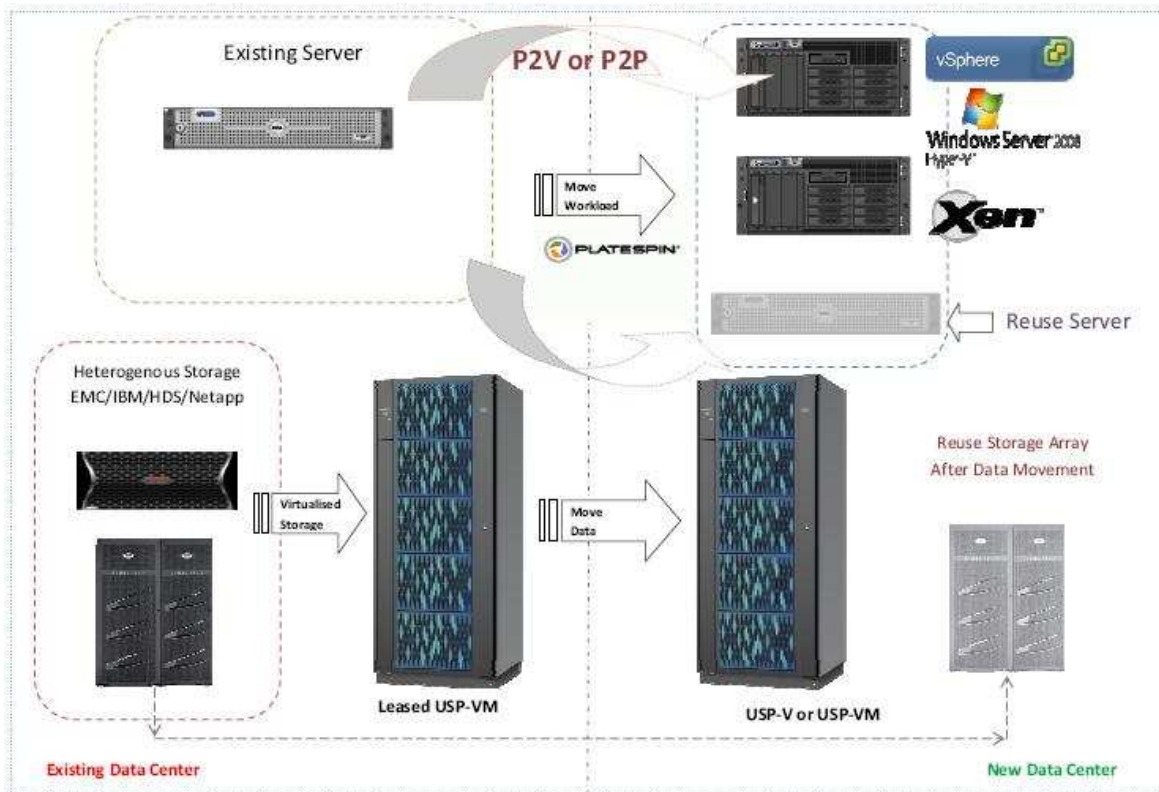
- Preparation of migration of RL-3 batch of servers
- Selecting the pre-configured Platespin migrate scenarios
- Co-ordination with network and security teams for preparation of source and target environments
- Preparation of DNS and connectivity with dependant applications is most important
- Submission of change control requests for migration of production environment.
- Carry out tasks required for actual migration during change window

Execute the above steps for each batch of servers documented in the plan phase in order of availability and data storage requirements.

The migrations should be planned in order to free up server and storage hardware completely as fast as possible, which can then be shipped to target site for adding additional hardware.

Additional SAN hardware like FC routers or FCIP switches may be required depending on the situation.

The process will thus ensure continuous recycling of hardware and reduce CAPEX on the project. An illustration of the possible reuse scenarios is shown in the figure below

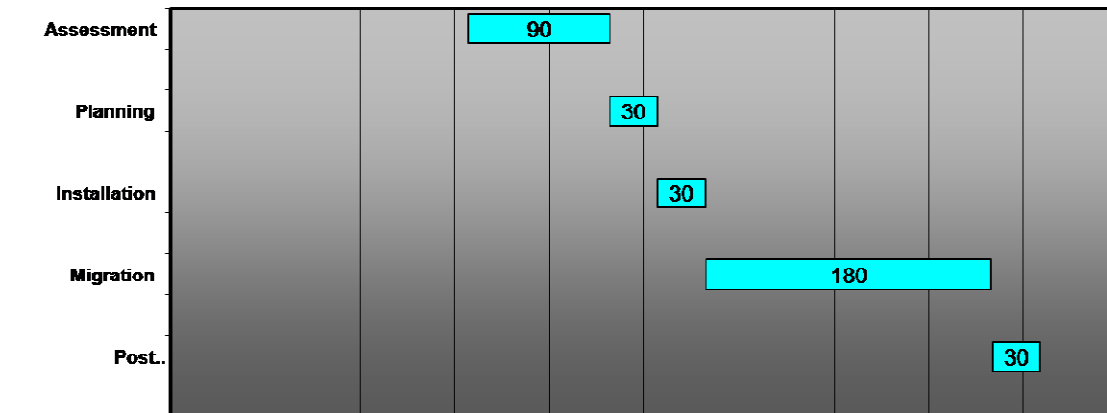


## Project duration and Resource requirements

### Project duration

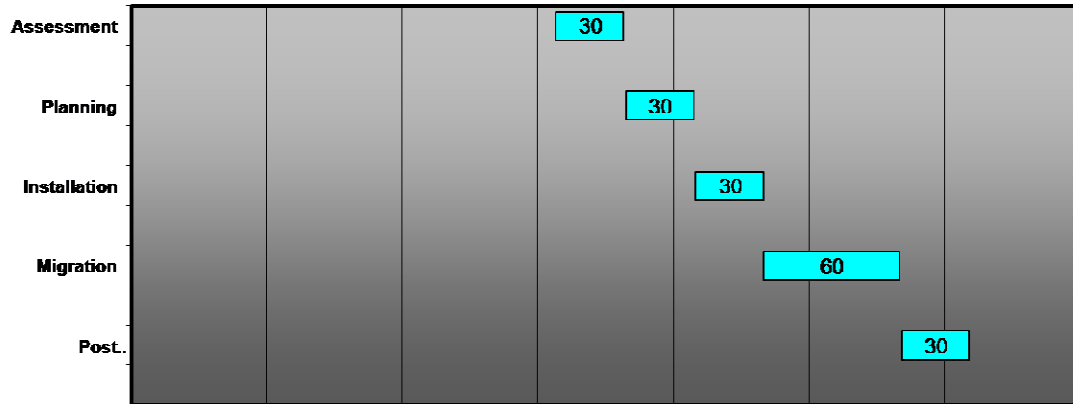
The project duration using our approach can help company's complete migrations within a few days or months.

An illustration of the timeline required using traditional approach



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An illustration of the timeline required using CoPar's approach using automated tools for assessment and migration.



As you would observe, use of PSRecon offers tremendous savings by automating discovery and assessment. PSRecon also monitors the servers at specific intervals gathering performance data which helps in analysing if the workloads are worthy of consolidation onto virtualized platform. Not all workloads are worthy of virtualization and the only solution that offers P2P migrations is Platespin Migrate, making it the defacto standard for DCT migrations.

USP-VM is a storage virtualization hardware from Hitachi Data Systems that offers the easiest and seamless strategy to virtualize heterogenous storage and migrate over a long distance. HDS replication technology named Hitachi Universal Replicator provides technology that helps transmit data even over low bandwidth lines.

## Resource Requirements

Role	Description	Numbers	Site/Offsite
<b>Project and Delivery Manager</b>	Responsible for interaction with the client and liaison with vendors. Must have experience in delivery of IT infrastructure projects which involve complex requirements. Good communication and co-ordination skills.	1	Site
<b>ICT consultant</b>	Responsible for assessment, planning and design of the migration scenarios. Needs to learn use of tools like Platespin Recon and gain a high level overview of HDS solutions. Must have breadth of knowledge in DCT infrastructure, which includes enterprise apps, servers, storage, networks and security. Able to use documentations tools like MS Visio and craft useful documents for use by admins.	1	Site/Offsite
<b>Network and Security Admin</b>	Able to work with the client security team to modify rules and network routes for new hosting environment. Ideal candidates should be CCNP with knowledge of common security appliances and secure communication protocols such as IPSEC.	1	Site/Offsite
<b>Virtualization expert</b>	Expert in migration of physical and virtual workloads to public or private clouds. Ideal candidates should have expertise in Vmware or Xen products with good knowledge of Windows and Linux. Ideally required to have experience on working with Platespin tools. The candidate is expected to perform migration of physical and virtual workloads to the cloud infrastructure. Prior experience of managing cloud instances and storage is a great advantage.	2	Site/Offsite
<b>Storage Administrators</b>	Storage administrators with knowledge of HDS storage solutions preferred. Need to have exposure to HDS replication technologies.	2	Site/Offsite
<b>Windows/Linux/Unix administrators</b>	Depending on the workload requirements, professionals with expertise in operating systems need to be engaged. Exposure to virtualization technology and migrations will be an added advantage. Exposure to Platespin migration tools and added advantage.	2-5	Site/Offsite

\*\* Exact resource requirements can be gauged only from RFP and SOW documentation available for each project.

## About the author

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Biju Krishnan is the founder and partner at CoPar Systems. He brings in experience of working with global corporations in the DCT space and has held key positions in operations and consulting. He is based in Mumbai, India and is actively involved in developing CoPar's DCT offerings.

## About the company

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CoPar Systems is a company focussed on developing innovative IT infrastructure solutions. Currently its focussed on delivering a Dynamic IT Infrastructure Platform along with server and storage virtualization services from leading vendors.