CLOSING THE GAP

UBC ENTERPRISE SYSTEMS
DISASTER RECOVERY

PROJECT OVERVIEW FOR BCNET / APRIL 2019

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The Problem
The Challenges
The Approach
The Lessons
Going Forward

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SITUATION

- Large, complex, and distributed multi-platform system, database, and application environments; voluntary & involuntary federations

- Some centralized and standardized resilience / availability solutions in place such as onsite / offsite data replications, backups, clusters

- Lacked practical, integrated, coordinated, and timely recovery solution for Vancouver campus data center disaster scenario

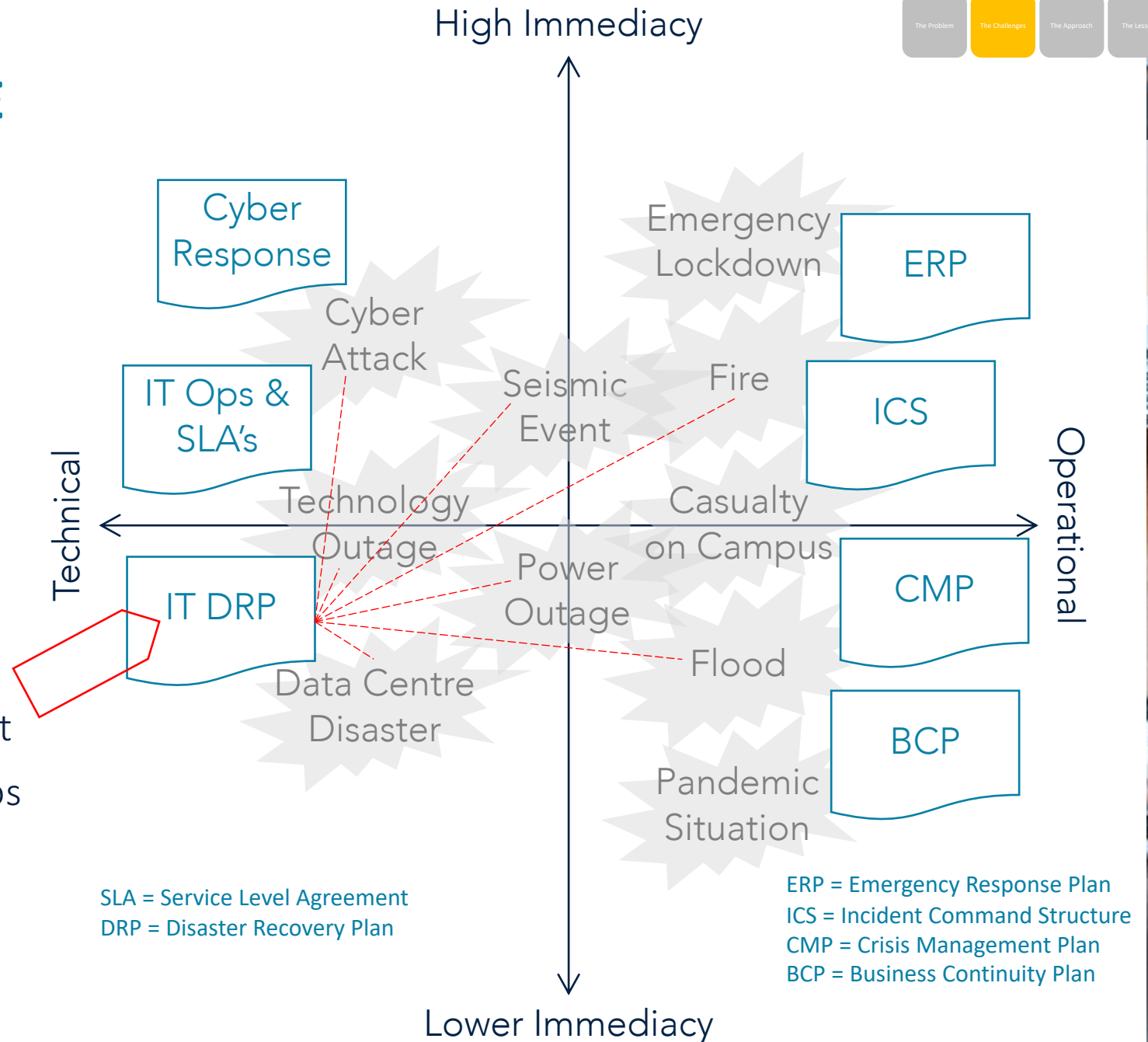The Problem | The Challenges | The Approach | The Lessons | Going Forward

CHALLENGES

- Initiative business prioritization within University IT portfolio

- Alignment of business, operational, and technical resilience needs

- Conflating and conflicting technological requirements and priorities

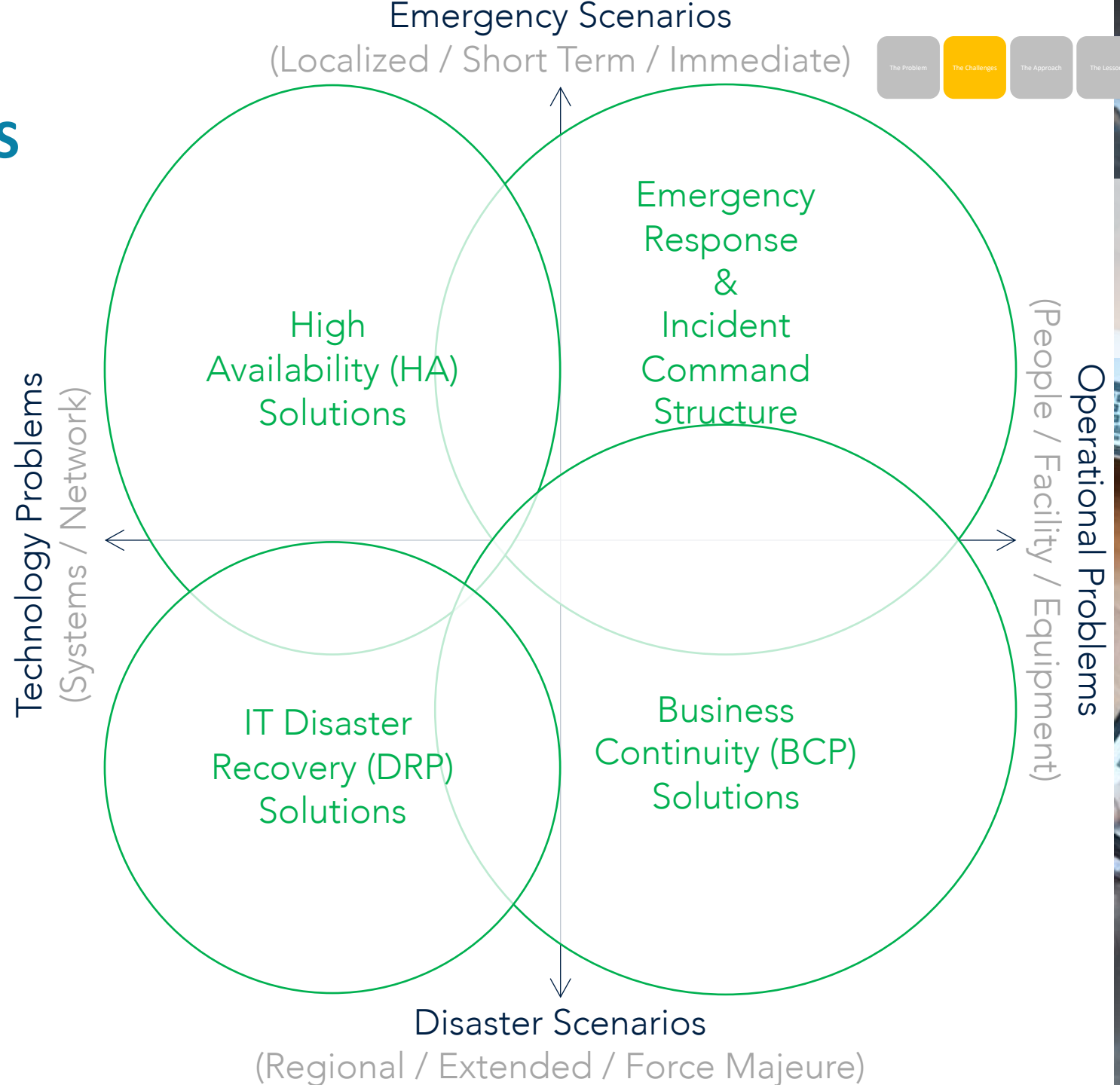- "Strategic paralysis"

- "Scope paralysis"

RESILIENCE LANDSCAPE

- The institution needs to be prepared for a multitude of emergency and risk scenarios

- IT DRP is an integral part of the overall University resilience planning landscape

- IT DRP addresses a specific subset of technology disruption scenarios

High Immediacy

Cyber Response

IT Ops & SLA's

Technical

IT DRP

Cyber Attack

Seismic Event

Technology Outage

Data Centre Disaster

Fire

Emergency Lockdown

Casualty on Campus

Power Outage

Flood

Pandemic Situation

ERP

ICS

CMP

BCP

Operational

Lower Immediacy

SLA = Service Level Agreement
DRP = Disaster Recovery Plan

ERP = Emergency Response Plan
ICS = Incident Command Structure
CMP = Crisis Management Plan
BCP = Business Continuity Plan

SOLUTION ALIGNMENTS

- The institution has different requirements for High Availability (HA), Business Continuity (BCP), and IT Disaster Recovery (DRP) solutions

- Focus of this project is IT Disaster Recovery

Emergency Scenarios
(Localized / Short Term / Immediate)

Technology Problems (Systems / Network)

Operational Problems (People / Facility / Equipment)

High Availability (HA) Solutions

Emergency Response & Incident Command Structure

IT Disaster Recovery (DRP) Solutions

Business Continuity (BCP) Solutions

Disaster Scenarios
(Regional / Extended / Force Majeure)

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GOVERNANCE PATH

BoG Risk Register → Program Executive Sponsors → ITAC / OCIO → Project Funding Approval → UBC IT PMO

STAKEHOLDERS ENGAGEMENT – BUSINESS IMPACT ASSESSMENT

Application Data Loss High Impact Threshold

VP Areas	SIS	LMS	FASmail	HR	Finance	Treasury	Pensions	Research Admin Systems	Research Operational Systems	Research Facilities & Equipment
All Areas - UBC Combined	< 1 hour	< 1 hour	< 1 hour	< 1 day	< 1 hour	< 1 hour	< 1 week	< 1 hour	< 5 mins	< 1 hour

Application Unavailability High Impact Threshold

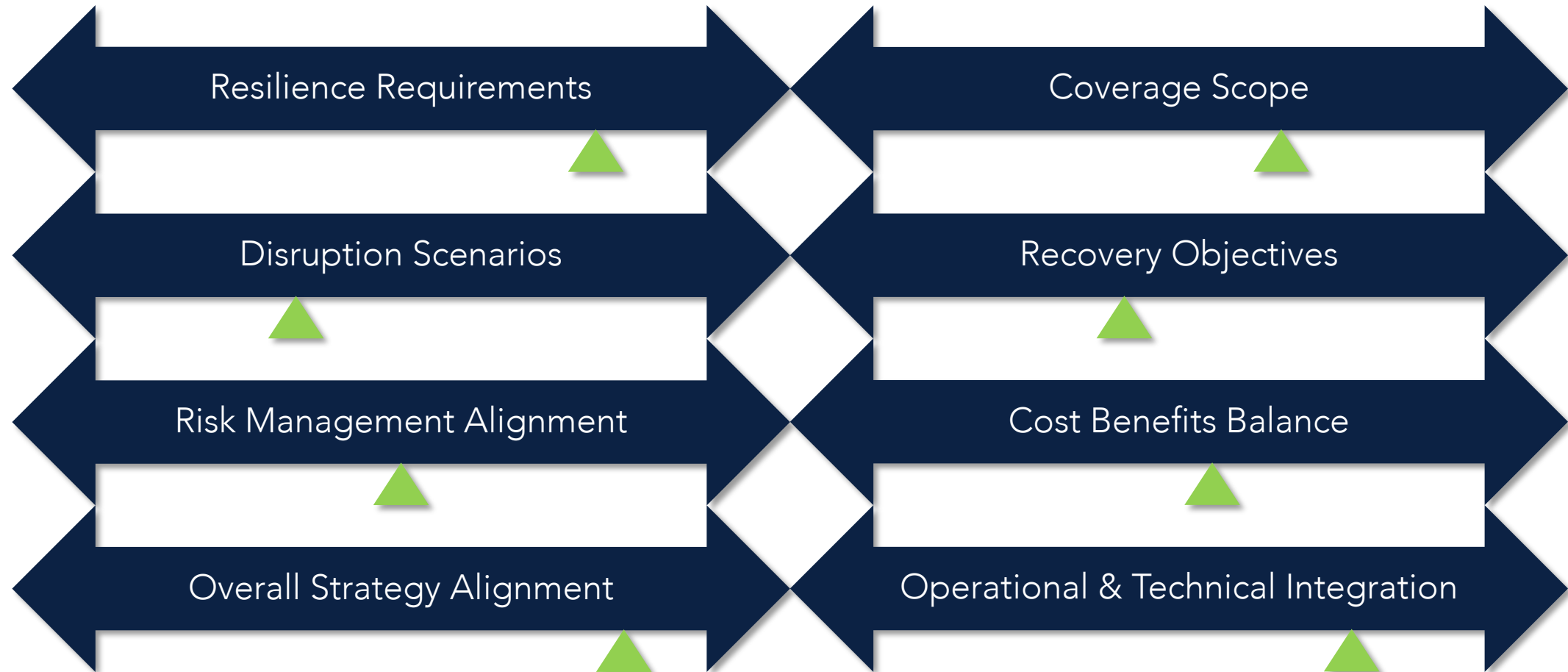| VP Areas	SIS	LMS	FASmail	HR	Finance	Treasury	Pensions	Research Admin Systems	Research Operational Systems	Research Facilities & Equipment
All Areas - UBC Combined	< 1 hour	< 1 hour	< 1 hour	< 1 day	< 1 hour	< 1 day	< 1 week	< 1 hour	< 1 hour	< 1 hour
DVC & VP UBCO				< 1 day		< 1 day	< 1 week	< 1 hour	< 1 hour	< 1 hour
						>= 1 week	< 1 week	>= 1 week	>= 1 week	>= 1 week
						>= 1 week	< 1 week	>= 1 week	>= 1 week	>= 1 week
						>= 1 week	< 1 week	< 1 week	< 1 week	< 1 week
						< 1 day	< 1 week	>= 1 week	>= 1 week	>= 1 week
						>= 1 week	< 1 week	< 1 hour	< 1 hour	< 1 hour
						>= 1 week	< 1 week	>= 1 week	>= 1 week	>= 1 week
						>= 1 week	< 1 week	>= 1 week	>= 1 week	>= 1 week

Process to Institution Priorities High Impact Threshold

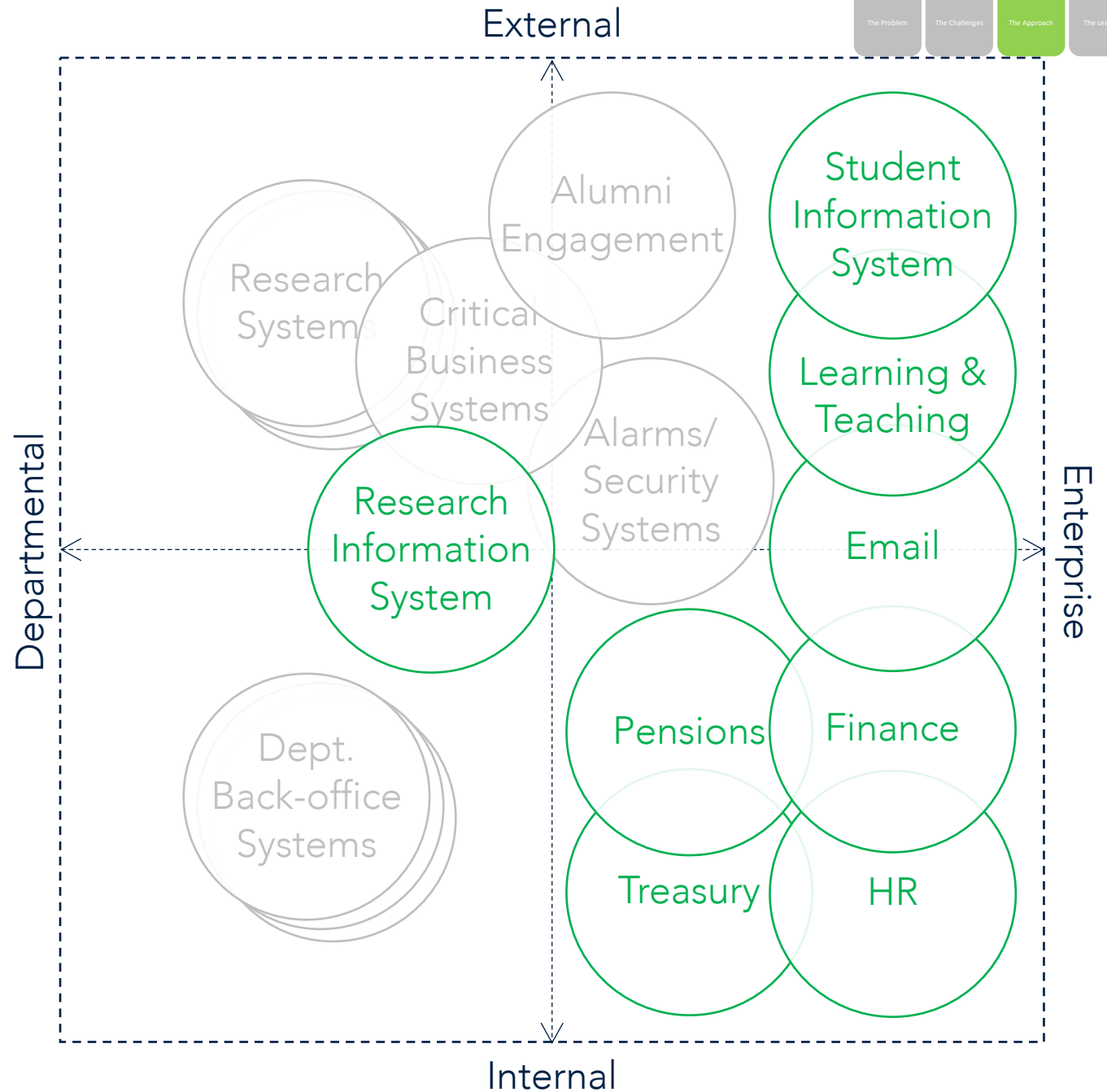| VP Areas	1. Safety & Security	2. Operations, Environment & Properties	3. Teaching	4. Research	5. Compliance, Legal, & Financial
All Areas - UBC Combined	< 5 mins	< 5 mins	< 1 hour	< 1 hour	< 5 mins
DVC & VP UBCO	< 5 mins	< 5 mins	< 1 hour	< 1 hour	< 5 mins
VP Development & Alumni	>= 1 week	>= 1 week	>= 1 week	>= 1 week	< 1 week
VP External Relations	< 1 hour	< 1 week	>= 1 week	>= 1 week	< 1 day
Provost & VP Academic	< 1 day	< 1 hour	< 1 hour	< 1 day	< 1 hour
VP Finance & Operations	< 5 mins	< 5 mins	< 1 hour	< 1 hour	< 5 mins
VP Research & Innovation	< 1 day	< 1 day	< 1 day	< 1 hour	< 1 hour
VP Students	< 5 mins	< 1 hour	>= 1 week	>= 1 week	< 5 mins
VP Human Resources	< 1 day	>= 1 week	< 1 week	< 1 week	< 1 week

STRATEGY / SCOPE ALIGNMENTS

- The cost / risk / benefits balance of the IT DR solution is driven by the final decisions vector

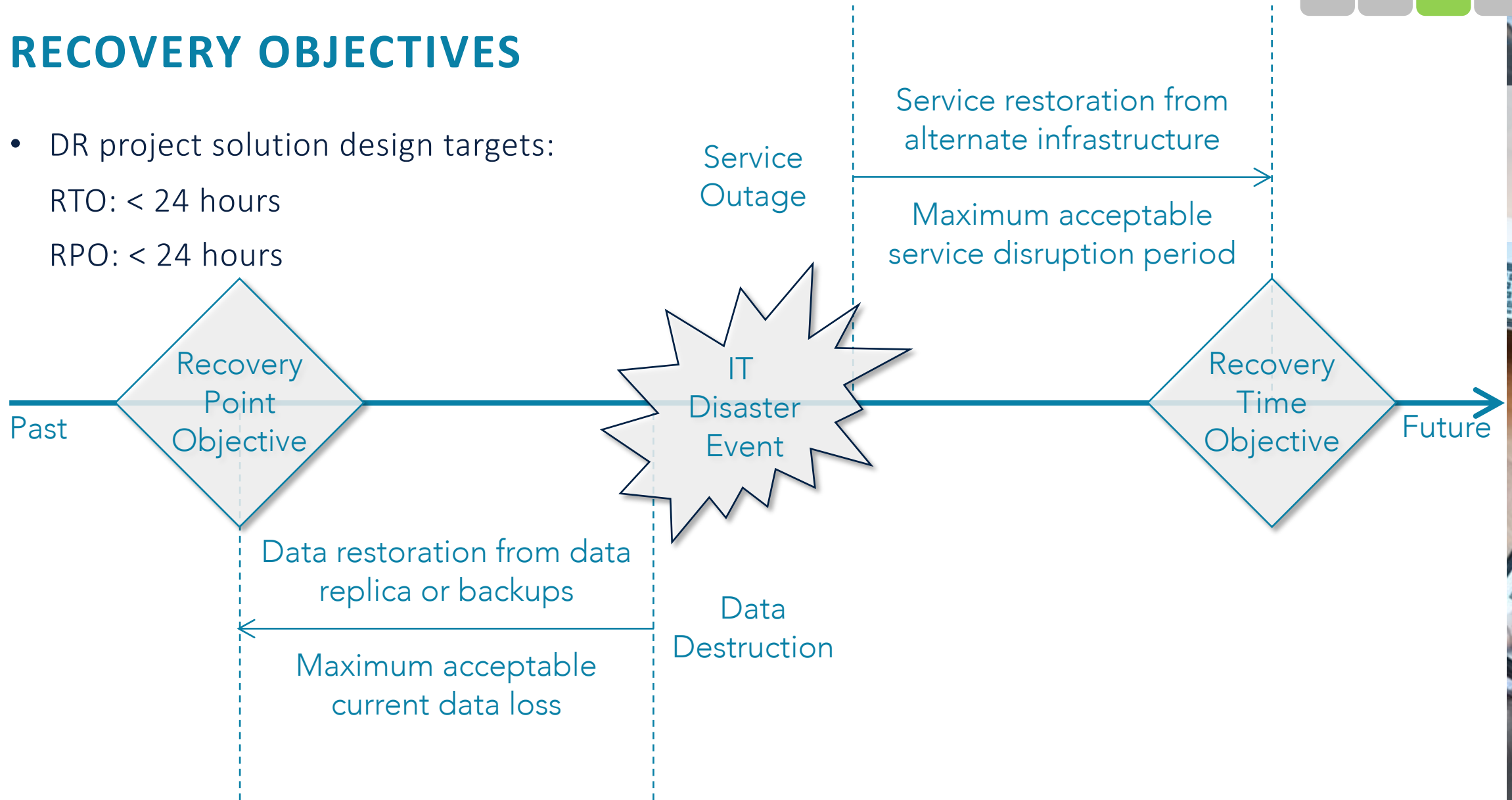|	
Resilience Requirements	Coverage Scope
Disruption Scenarios	Recovery Objectives
Risk Management Alignment	Cost Benefits Balance
Overall Strategy Alignment	Operational & Technical Integration

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SYSTEMS SCOPE

- Focus for DR project was on enterprise-wide, legacy, on-premise, non-realtime, systems

External

Internal

Departmental

Enterprise

Alumni Engagement

Research Systems

Critical Business Systems

Alarms/ Security Systems

Student Information System

Learning & Teaching

Email

Research Information System

Pensions

Finance

Dept. Back-office Systems

Treasury

HR

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RECOVERY OBJECTIVES

- DR project solution design targets:

RTO: < 24 hours

RPO: < 24 hours

Service Outage

Service restoration from alternate infrastructure

Maximum acceptable service disruption period

Recovery Point Objective

IT Disaster Event

Recovery Time Objective

Past

Future

Data restoration from data replica or backups

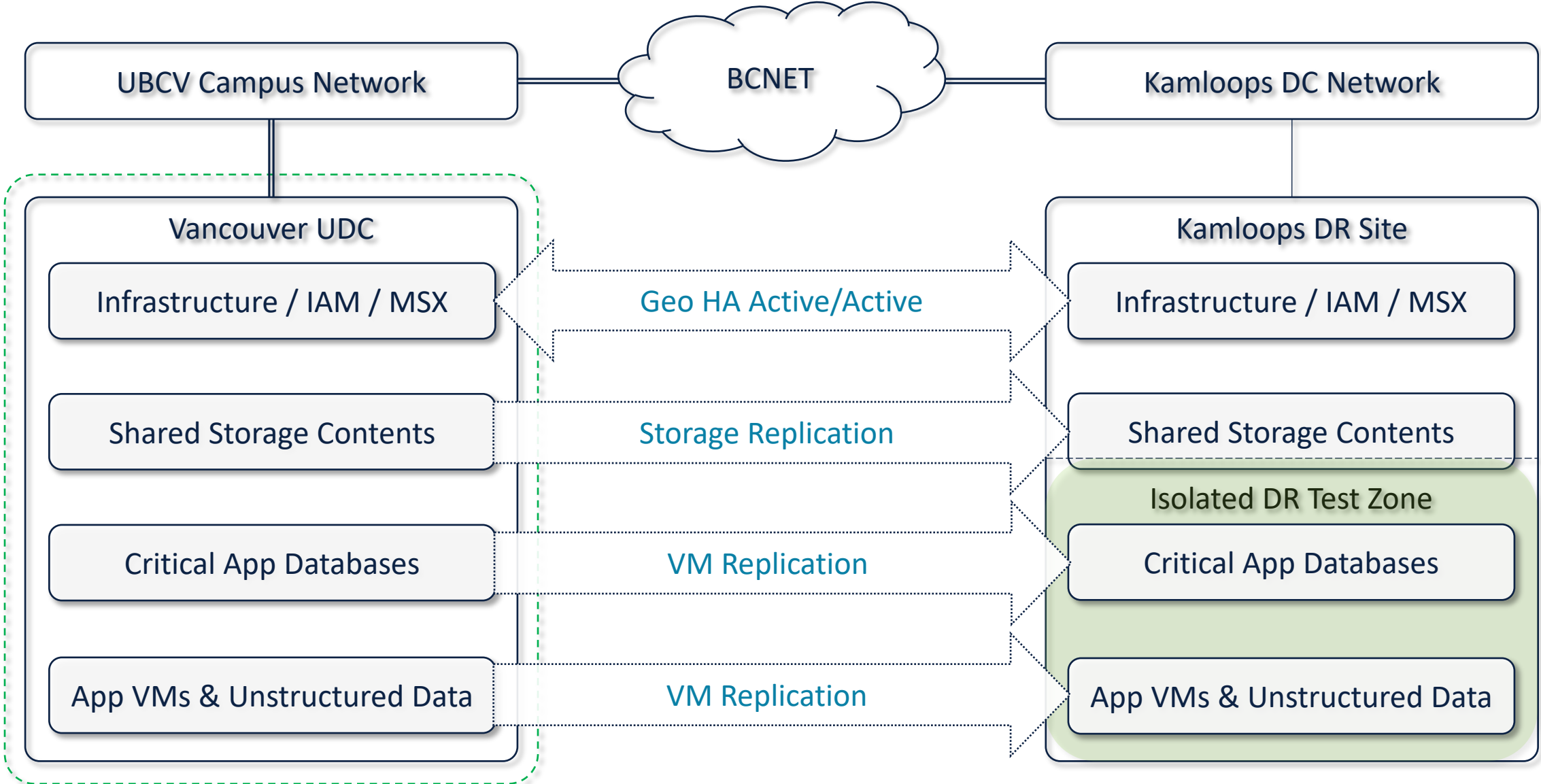Maximum acceptable current data loss

Data Destruction
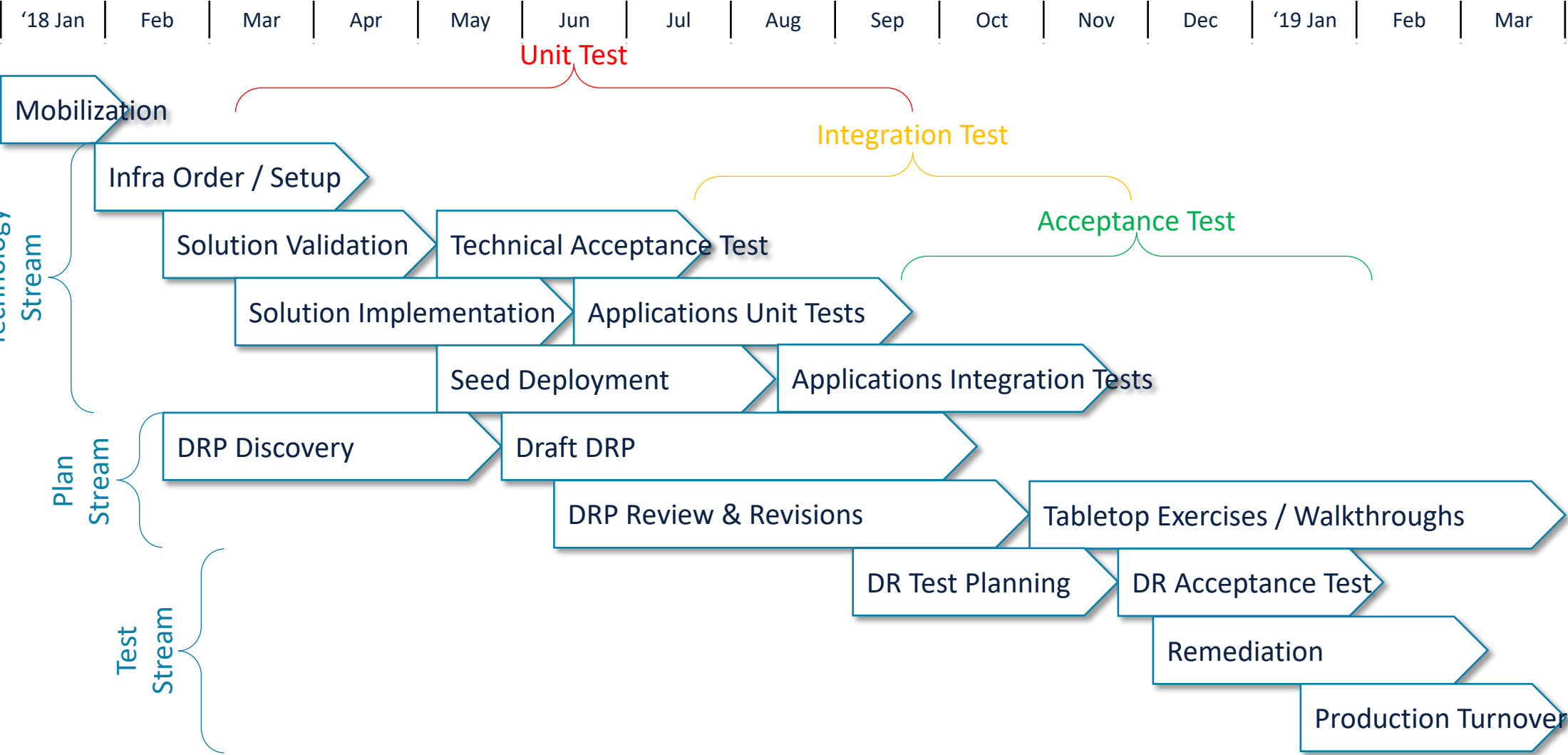
PROGRAM APPROACH

1. Establish enterprise systems DR first

2. Then address balance of on-premise UBC environments via DR as a Service approach

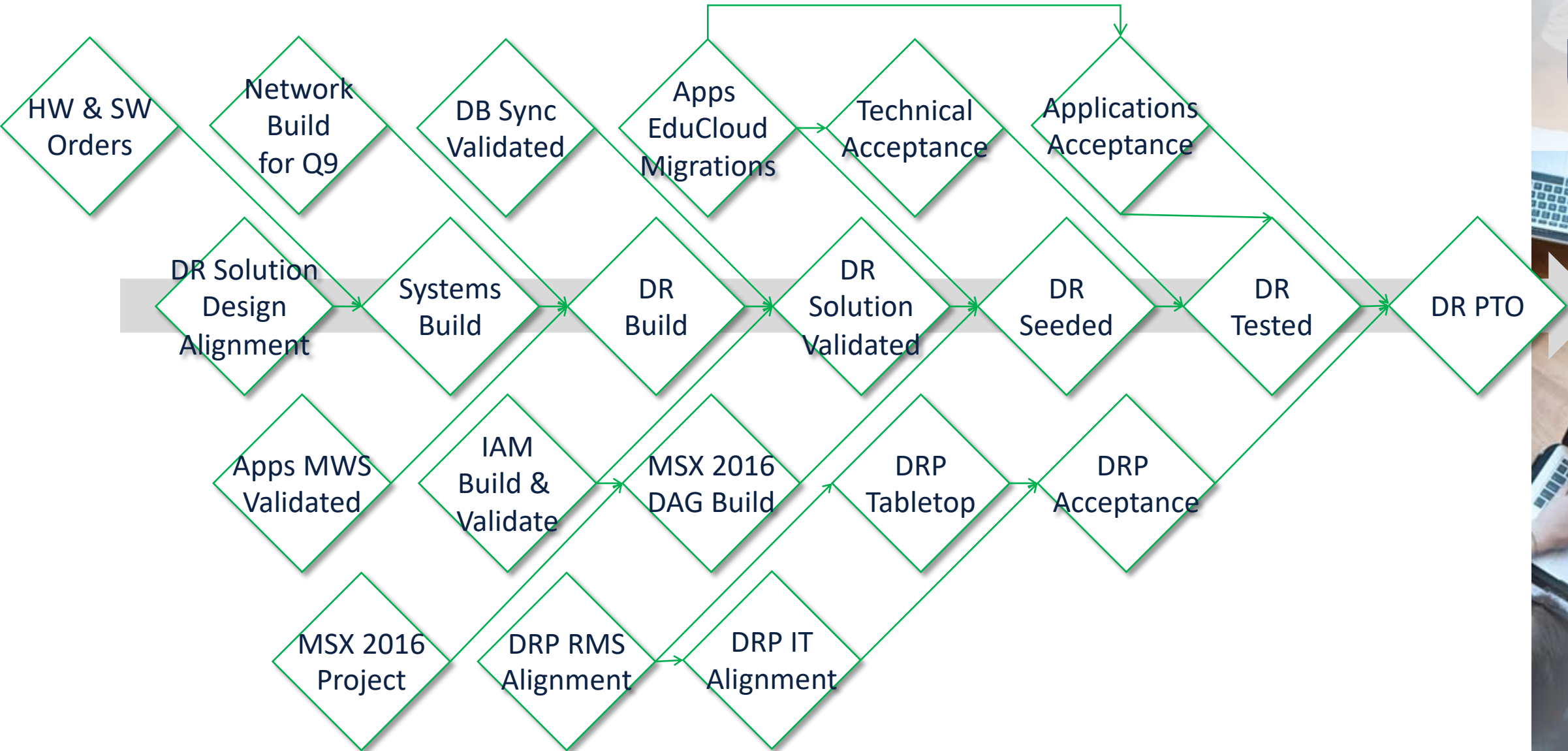3. Balance and align between on-premise and cloud migration strategies execution & timing

Maturity

Other Initiatives

DRaaS

Cloud Strategy

Enterprise Systems DR

Initial State

Time

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TECHNICAL APPROACH

UBCV Campus Network	BCNET	Kamloops DC Network

Vancouver UDC

- Infrastructure / IAM / MSX — Geo HA Active/Active → Infrastructure / IAM / MSX
- Shared Storage Contents — Storage Replication → Shared Storage Contents
- Critical App Databases — VM Replication → Critical App Databases
- App VMs & Unstructured Data — VM Replication → App VMs & Unstructured Data

Kamloops DR Site

Isolated DR Test Zone

PROJECT WATERFALL

| '18 Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | '19 Jan | Feb | Mar |

Unit Test

Integration Test

Acceptance Test

Mobilization

Technology Stream

Infra Order / Setup

Solution Validation

Technical Acceptance Test

Solution Implementation

Applications Unit Tests

Seed Deployment

Applications Integration Tests

Plan Stream

DRP Discovery

Draft DRP

DRP Review & Revisions

Tabletop Exercises / Walkthroughs

Test Stream

DR Test Planning

DR Acceptance Test

Remediation

Production Turnover

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PROJECT CRITICAL PATH / WEEKLY SPRINT CADENCE

PARALLEL IMPLEMENTATION STREAMS

1. Enact parallel implementation streams for in scope applications

2. Dependent on underlying DR infrastructure being functional

3. Project benefits outweigh the higher project delivery overhead

4. Requires a highly committed and engaged core project implementation team

Application Streams	Minimum Working Set	DR Test Planning	EduCloud Migration	Unit Testing	Integration Testing	Acceptance Testing
	Define list of application servers in scope for DR	Create DR test plans for application	Migration of in scope servers to EduCloud	Jumpbox setup & testing, and initial DR shakedowns	Conduct integration testing for application DR	Conduct DR test for application and document results
IAM	🟢	🟢	🟢	🟢	🟡	⭕
SIS	🟢	🟢	🟢	🟡	🟡	⭕
LTE / CTLT	🟢	🟢	🟢	🟢	🟡	⭕
LTE / LMS Kaltura	🟢	🟢	🟢	🟢	🟡	⭕
HR / Finance	🟢	🟡	🟢	⭕	⭕	⭕
IR	🟢	🟢	🟢	🟡	🟡	⭕
Hyperion	🟢	🟢	🟢	🟡	⭕	⭕
RiSE	🟢	🟢	🟢	🟢	🟡	⭕
Pensions	🟢	🟢	🟢	🟢	🟢	⭕
Treasury	🟢	🟢	🟢	🟢	🟡	⭕
CFI Equipment DB	🟢	🟢	🟢	🟢	🟡	⭕
SharePoint	🟢	🟢	🟢	🟢	🟡	⭕
FASmail	🟡	🟡	🟡	⭕	⭕	⭕

UBC

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LESSONS

Succinct & Specific Mandate	BIA / Engagements	Scope / Objectives Alignment	UBC IT Stakeholders Engagement	Scope Conflation Management & Drift Control
Iterative Solution Architecture Alignment	DR Testing Solution Architecture	Scrum / Agile Sprint Cadence	Enable Parallel Application DR Streams	Solution Heterogeneity / Flexibility
Technical Surprises	Operational Surprises	DR Operational Readiness Half-life	Did we mention scope conflation & drift?	Project Management Hygiene

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GOING FORWARD

| DR Coordination & Plan Management | DR Program & Enrolment Management | CAB / ITSM Integrations & Operations | Ongoing Testing & Exercises | Integration & Alignment with Other Initiatives |

THANK YOU!

Questions?

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