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FUJITSU

LOT2 - STORAGE

Case Study
University of Bolton

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I. INTRODUCTION

In reviewing our reference library and our recent business within the Education sector, we have selected our recent win at the University of Bolton with Insight UK as our reference case for Lot 2 Storage. This project demonstrates our strategy of partner first and the capability of our partner network within the Education business.

We have structured our response to cover the areas that you need information upon to clearly demonstrate to you that we have the skills and capabilities to deliver against Lot2 Storage within the Framework.

In selecting partners to work with on the SSSNA Framework, Fujitsu ensure that their Design and Project Management methodologies are in line with ours, such that as an OEM we are assured that our partners can deliver to the same standards as if it was Fujitsu delivering the project.

Background and requirements

The University of Bolton was seeking an efficient and cost-effective solution replacement for its ageing SAN which underpinned all the University's systems, IT infrastructure and services.

The qualities of the replacement storage solution were that it should have sufficient capacity for growth in the storage need for 5 years; have sufficient performance capacity; should provide resilience against failure on critical services; and should be capable of providing cost effective scaling out using off premises cloud storage when required.

The project requirements were as follows

- A resilient Storage Area Network capable (capacity, availability, and performance) of supporting the teaching, learning and research activities of the University, including the expansion of digital media and arts.
- An on-premises solution that is capable of sustaining the University's primary storage needs for 5 years, and which can be expanded and is easily managed.
- Creation of an asset for the University that is both financially and environmentally sustainable.
- An efficient and cost-effective solution that will meet and/or exceed user expectations and improve the performance, security, and resilience of the University's data infrastructure.
- Meet the University's existing and future requirements for robust and resilient enterprise data storage that is configured between the Deane and Eagle sites.
- Provided sufficient capacity for growth in the storage need for 5 years have sufficient performance capacity, provide resilience against failure on critical services and should be capable of providing cost effective scaling out using off premises cloud storage when required.
- A suitable design, installation, and support services against an anticipated storage system requirement for 5 years.

II. PROJECT DATA SYNOPSIS

1. ENTITIES INVOLVED AND RESPECTIVE ROLES IN THE PROJECT

This project was conducted by Fujitsu Services Limited and its partner Insight UK (Prime Contractor).

For a more detailed description of the role distribution between each of the parties in the project, please refer to the Section III further on.

2. PROJECT NAME AND GEOGRAPHICAL LOCATION

The Project 'Installation and Support of the University of Bolton's Storage Area Network' was contracted with the Bolton University for the delivery of infrastructure and services in the university campus.

3. PROJECT TIMEFRAME

The project started in September 2020 and was completed in July 2021. This extended timeframe was attributable to access restrictions at the University due to Covid19.

III. DESCRIPTION OF THE SOLUTION PROVIDED, TECHNOLOGY DEPLOYED AND WARRANTY TERMS

The solution comprised of a Fujitsu All Flash Extreme Performance ETERNUS AF250 SAN at both sites and this was chosen because

- Flash technology protects the University's storage strategy and investment, as All Flash represents the future of Hard Drives, as they are the only drives manufacturers are investing in
- Fujitsu's Enterprise All Flash Storage Arrays, delivers "Extreme Performance" at extremely low latencies

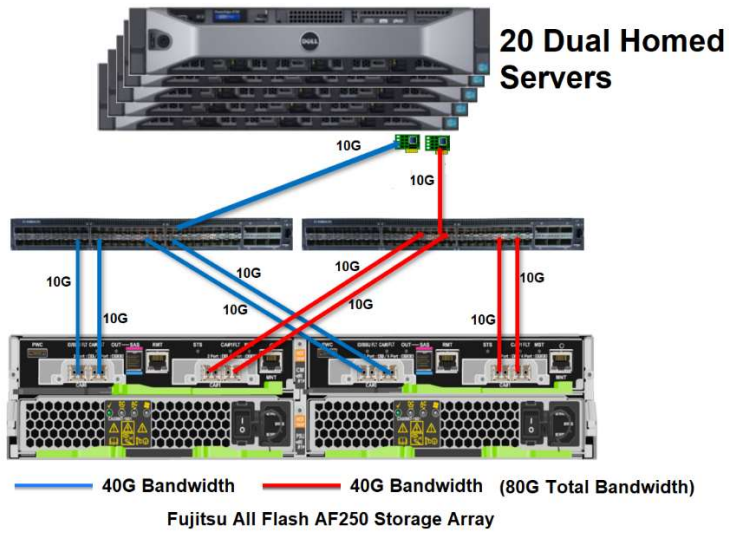
Site One had 250TB Useable capacity delivered by the following configuration:

- Fujitsu All Flash Extreme Performance AF250 SAN
- 44 * 7.64TB Flash Drives
- Dual Quad Port 10G Controllers
- Management port
- All Disks and Disk enclosures at @ 12Gb/s SAS
- IOPs 600,000 sustained, 1.3Million theoretical IOPs

Site Two had 125TB Useable capacity delivered by the following configuration:

- Fujitsu All Flash Extreme Performance AF250 SAN
- 22 * 7.64 Flash Drives
- Dual Quad Port 10G Controllers
- Management port
- All Disks and Disk enclosures at @ 12Gb/s SAS
- IOPs 600,000 sustained, 1.3Million theoretical IOPs

The solution is summarised below:



Each array was supplied with Fujitsu ETERNUS SF Storage Management Suite which is a comprehensive data management solution with enterprise class functionality providing Configuration and Correlation Management, Fault Management, Performance Management, Automated Storage Tiering Management, Replication and Backup Management, Disaster Recovery Management, Business Continuity Management, and Energy Consumption Management.

The solution was provided with a 5 year 24 * 7 support contract for hardware and Software. Which included onsite 4 Hour response.

Fujitsu can extend both the term (up to maximum of 5 years) or uplift the Service Level as required (for example to '4hour Response').

When considering requests for extended warranty Fujitsu considers:

- The End of Support Life (EOSL) date, which is 5 years from the last sale i.e., End of Sales (EOS) date. Fujitsu can offer support up to the End of Support Life date and this is a standard process. When support is required beyond the EOSL date, Fujitsu has to consider the availability of spares, as when systems are no longer manufactured the availability of spares reduces as they are not replaced. If a customer is planning a tech refresh of the equipment, and requires Fujitsu to support the equipment being replaced, this will influence the decision to offer extended support. If the customer gives Fujitsu sufficient advanced warning of needing extended support beyond the EOSL date, Fujitsu can investigate whether it can do a 'last time buy' of spares for the particular configuration and ring fence it for the customer use only (at additional cost).
- Uplift to on-onsite response and improved time to fix depend mainly on location, in relation to where spares are located and the availability of suitably qualified engineers.

Design and Deployment Approach

Fujitsu chose to work with Insight for this opportunity, as they were skilled in Fujitsu AF technology as well as being geographically located close to the University of Bolton.

For the tender response, Fujitsu worked with Insight to assess the requirements provided and through the Clarification Questions process clarified areas of doubt to produce an outline of the High-Level Design and an outline of how the delivery project would be managed, using PRINCE2 project management methodology for the submission document.

We will cover the following in greater detail as requested by you

1. Project management
2. Design Method
3. Risk Management
4. Customer liaison
5. Cost management

1. PROJECT MANAGEMENT

Fujitsu's standard methodologies are based upon industry best practice guidelines. These in combination with our own extensive experience form the basis of our Manage Project, Manage Programme and Manage Risk processes. Together these form constituent elements of our overall ISO9001:2008 assured Business Management System (BMS).

The 'Manage Project' processes are defined for use by all Fujitsu projects, irrespective of project size and nature of deliverables, and incorporate a comprehensive set of PM tools including detailed procedures, templates, and tools.

Project Management for this project was provided by Insight utilising resources from Fujitsu, as necessary and working with the University of Bolton's Implementation Team. This project formed part of the wider University of Bolton's ICT

Infrastructure Improvement Programme and regular updates were provided by the PM to Infrastructure Improvement Project Board.

Working with the University of Bolton, the Insight project manager

- Provided the project initiation document (PID) and kept it up to date throughout the project lifecycle
- Provided the project plan and kept it up to date throughout the project lifecycle
- Liaised with all project stakeholders to ensure the smooth running of the project
- Controlled the project stages, providing highlight reports, updated project plans and escalating issues and risks as necessary
- Managed the process of user acceptance, handover to University of Bolton and project closure.

Project Team Structure & Roles

Members of the Project team were

- Project Manager from University of Bolton, to liaise with the Insight Project Manager and project team to ensure that project deliverables were supplied according to the agreed plan,
- Project Manager from Insight, to manage all members of the project team to ensure efficient and timely completion of the project. Reported into the project board. Provided technical support as required
- Design Authority, who documented the design of the solution and produced the HLD, LLD and configuration guides
- Subject Matter Expert (SME) from Fujitsu, who provided advice and input on the AF250 to the design team.

Furthermore, Fujitsu supplied the following personnel to ensure the delivery of the project to time and budget

- Technical Account Manager (TAM), who conducted a list of tasks 30 days prior and 30 days post application go live date. This ensured the solution is 'Ready for Service' and fully met University of Bolton's expectations
- A Service Delivery Manager (SDM), who coordinated the deployment from product delivery to resource on site. Through landing to ready for service. They also remain as the Single Point of Contact for all Service-related issues throughout the duration of the Contract.

Project Scope and Stages

The scope of this project was as follows:

- Storage Commission
  - Fujitsu and Insight commissioned, configured, and allocated the storage arrays as per University of Bolton requirements, including connecting to the existing Virtual server environment
  - Fujitsu implemented and completed the initial configuration of the Storage software for snaps, clones, replications etc.
  - Fujitsu and Insight configured the SAN environment such that the local attached devices and remote devices were "fabric aware" and accessible to the storage subsystem
- Functionality and Application Testing
  - Together with the University of Bolton Fujitsu tested the functionality of all the licensed software to run on the storage subsystems
  - Then tested and confirmed the functionality of the Storage Array
- Removal of Legacy Infrastructure
- Training

  - Through a combination of knowledge transfer during the project together with formal training, Fujitsu made sure that the University of Bolton IT resources have the necessary skills to fully support the operation, deployment, and exploitation of the new Fujitsu Enterprise Data Storage facility.
- Documentation
  - Provision of the full documentation relating to the specific configuration of the storage implemented within the project which will be available and delivered to the University upon completion.
- Transitional Support
  - Fujitsu and Insight will assist in transitional support from the old to the new environment for a period of 2 months post project completion.

Out of scope were

- Backup and Recovery Integration and Migration
- Data Migration

This whole project was conducted under covid regulations and a significant part of the preparation and planning was conducted remotely via Team calls, with the IT team from the University of Bolton working under the guidance of Fujitsu to prepare and get as much of the installation work completed. This meant that when covid restrictions were sufficiently lifted the Fujitsu TAM was able to complete the final configuration, testing and handover in just a few days.

Due to the prolonged nature of the project due to covid restrictions the SDM role has yet to fully take place but will become to the fore in the coming year. To date the SDM has

- At the end of quarter one, chaired a virtual Governance review to look back on the work completed and to document a lessons learnt/ success report to take forward into a development plan
- Acted as the conduit into Fujitsu and its partners for any issues that relate to the delivery of the service to the University of Bolton. It is the role of the SDM to be the face of University of Bolton and to ease their communication lines into Fujitsu and Insight.

On an ongoing basis the SDM will now

- Act as the University of Bolton incident management Single Point Of Contact for major escalation throughout the term of the Fujitsu support contract
- Issuing a simple KPI report, once a month, documenting all incidents raised, SLA achievement and any remedial actions taken.

Quality Management

In developing the Project Initiation Document (PID) the Insight PM worked with the University of Bolton to identify the acceptance criteria for a successful project completion and these were identified in the Acceptance Criteria table in the PID. The acceptance criteria were tested during the user acceptance test (UAT) tasks in the project plan.

The UAT was conducted jointly by Insight and University of Bolton to carry out the testing to satisfy project resourcing and ensure the smooth progression and successful completion of the testing.

2. DESIGN METHOD

As the project moved from the tender proposal to delivery, the Solution architect validated all the assumptions made during the tender submission, confirmed that the requirements were unchanged and completed the Overview architectural reference for the solution elements and how they would be deployed at a datacentre level.

The Solution architect followed the design method phases as follows:

- The design stage which covers preparation for implementation, operational running, and testing
- The develop stage to build the defined solution in a controlled environmental and the development of any associated implementation guides
- The deliver stage where the solution is implemented and tested. This was a joint activity with staff from University of Bolton who were going to be responsible for the ongoing support and operation of the solution. This ensured that validation of the solution was satisfactory and allowed for knowledge transfer of the solution.

Verification and validation are ongoing activities through the 'design and develop' and into the 'deliver' stages of the overall project of the designed Solution. Verification ensures that the final solution 'can be built right' whilst validation ensures that 'the right solution is built' and meets the Bolton University's requirements. The output is captured in a User Acceptance Test (UAT) document that documents the testing that was agree and the outcome of the tests.

The deliverables from the Design method were

- The High-Level Design (HLD) document that details all the Functional and Non-functional requirements how they are to be addressed, the design decisions made, and any Risks, Assumption, Issues and Dependencies that exist, which were worked through and addressed as the project progresses. The HLD was submitted the University of Bolton for approval and signed off before proceeding to a Low-Level Design
- The Low-Level Design (LLD) detailed the configuration of the solution and information needed to implement the solution
- Operational handover training for administrative staff. This typically occurs inline through the deployment in a hands-on fashion. It is not a substitute for a formal training programme.

3. RISK MANAGEMENT

The Fujitsu Manage Risk Process, which is mandatory throughout the lifecycle from the bid stage until closure of the contract, defines the steps (Initiate, Identify, Analyse, Plan and Manage) that every bid or contract is to progress through to ensure the appropriate management of risk. It is mandatory that a Risk Plan is produced and updated throughout the life of the project or service.

The risk plan for this project started during the tender stage where the bid team would have identified and classified risk in Technical, Legal and Commercial and Finance aspects of the proposal. These were captured as follows:

- Clarity of objectives (i.e., understanding what is at risk),
- Understanding of the environment in which the project or service would take place,
- Prioritisation of risks,
- Identifying and carrying out appropriate containment,
- Planning and timely invocation of fallback,
- Appropriate Escalation.

At the point of delivery, the bid Risk Plan moved to the PM for the delivery project and the PM reviewed the risks (as well as the assumptions, issues, and dependencies) and determined what action was needed or what information that had become available in order to de-scope the risk or to manage the risk such that the project, and solution are not compromised.

Any risks that remained were assessed continually throughout the project by the PM with the University of Bolton to identify potential risks that could put the project off track. These, together with any project-affecting issues raised by members of the project team were captured in a risk register and kept updated throughout the project by the PM. Each risk is rated and any that are deemed as a high rating were escalated to the project board to obtain a recommendation for the project team as to how this risk should be managed.

Within agreed tolerances, the PM worked with the project team to resolve the issue. If an issue or risk weighting become high or out of tolerance, it was escalated to the project board to assist in determining a resolution.

4. CLIENT LIAISON

At the start of the project, the communication strategy was agreed with the University of Bolton and stakeholders at the project kick off meeting. As the timeline changed and was prolonged due to covid restrictions the liaison was between the Fujitsu TAM and the Head of IT at the University and was conducted on weekly Teams call to keep the project and team updated on progress and next steps needed.

5. COST MANAGEMENT

The Project Manager (PM) is responsible for managing the cost for the project and is accountable to the Project Board for this. The PM will flag any significant deviation of the project in terms of costs or time and will seek guidance and approval from the Board before undertaking the changes.

The impact of restrictions of covid meant that the original plan had to be re-assessed. Different ways of working were sought, and the plan was adapted to minimise cost overrun such as engineers going to site but being unable to access the computer room. Pragmatism entered the conversation and in agreement with the University of Bolton we drew up a new plan, and remote working where the Fujitsu TAM would talk the University IT team through the tasks that needed to be carried out.

The timeline had lengthened, but the priorities has also changed, as this was about protecting the well-being of the University team, staff and students and Fujitsu's employees. The SAN solution is now installed, tested, and running, the documentation and training on the solution has been done, and the University IT team is now migrating the VM estate to the new SAN.

What we learnt on this project on how to adopt our approach, will be fed into our lessons learnt process where we review what went well, what could have gone better and what would we do next time, meaning that we can ways to improve the way we deliver solutions and project to our customers.