

# PFS ICS Hardware Configuration Report

DocId: PFS-ICS-PRU030000-06

Hassan Siddiqui

2020-04-10 (Original version: 2018-05-07)

## Overview

**This document provides a summary of the planned hardware configuration for the PFS ICS following discussions internally within the PFS team, and between the PFS and Subaru teams.**

## Changelog

Issue #	Author Initials	Summary of Changes
6	HS/PT	Added new figure 4
5	HS	Corrected garbled figure 1
4	HS	Updated the Sept 2018 configuration (fig 1) based on discussions between C Loomis and CDM
3	HS	Updated figures following comments from E Kyono regarding core switch details in current configuration and NFS client instances across hosts
2	HS	Updated target hardware configuration following comments during the ICS meeting at Taipei 2018-05-15. Provided new diagram representing current configuration.
1	HS	Initial version.

## Introduction

During the above period attempts to establish communications between the PFS ICS and Subaru were made, based on a working hardware infrastructure. Some limitations were found in that infrastructure:

1. There is lack of redundancy between the 100TB disk controller and the (single) NFS machine. This became apparent when the Fiber Cable (FC) link between the controller and the NFS node failed on 2018-03-23. This was fixed temporarily by the Subaru CDM team using an iSCSI link.
2. The hardware in place is rather old (circa 2009) and has no support at the time of writing.
3. The data storage utilizes a RAID configuration that is slow to rebuild and subject to correlated failures.
4. The original design involved many virtual machines (VMs), one for each software actor, which was found to be excessive in terms of installing and configuring for PFS use. In practice, only two VMs were used during the integration exercise.

5. Firewall access control (iptables) distributed across both the physical machines and the virtual machines proved to be an obstacle which both the Subaru CDM and the PFS instrument team found difficult to work with.

## September 2018 Hardware Configuration

Figure 1 shows the configuration that will be in place for the MCS tests in September 2018.

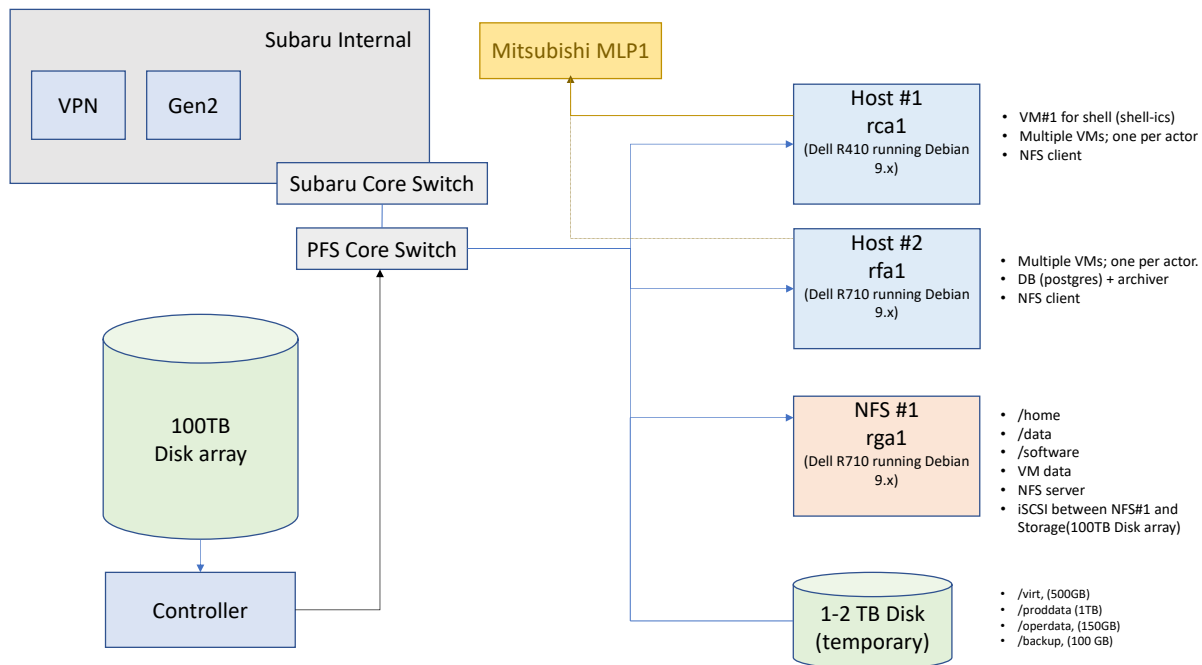


Figure 1: configuration for September 2018 tests

Figure 2 shows the detailed core switch layout and ethernet connections to the host and NFS machines.

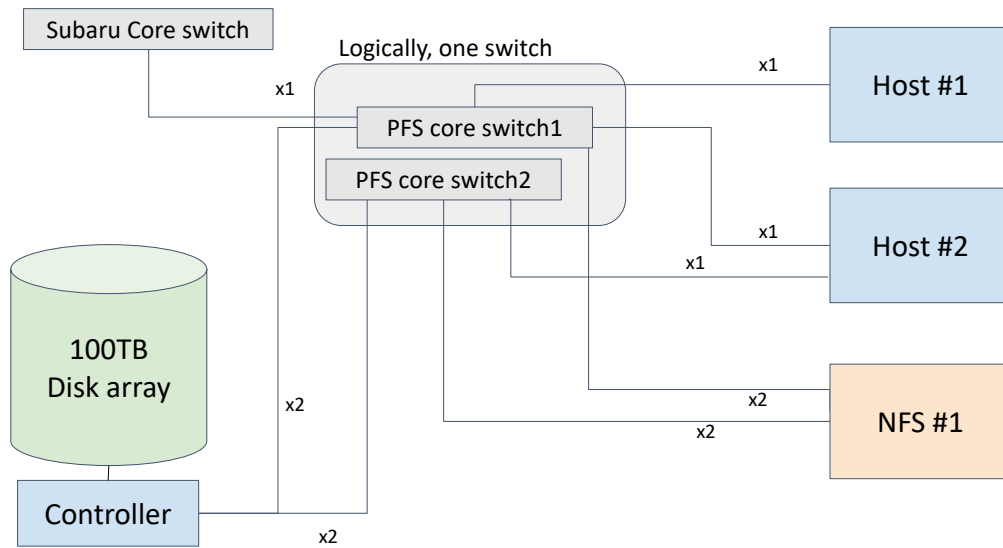


Figure 2: detailed core switch configuration

## Target Hardware Configuration

Following the issues mentioned above, the PFS and Subaru teams converged on a revised hardware configuration that will be the target for the future, that is shown in Figure 3. This allows:

1. Improved redundancy with the introduction of a second NFS machine, and 60TB disks on each of NFS#1 and #2 in the case the 100TB disk array fails. The most recent data on the array is replicated on the NFS#2 machine.
2. Reduced number of VMs (3). The DB RDMS and archiver should be maintained on one dedicated VM on a single physical machine. The other actors can be housed on a single VM without too much trouble.
3. Access control is simplified by moving the ACLs to the Subaru core switch (see [JIRA INSTRM-348](#)).
4. Serial ports will be provided on all hosts to support Mitsubishi's Auto-Guidance interface.
5. An additional host for PFI purposes is also included for completion.

Note that this hardware configuration should be regarded as the latest working version but not definitive. Further updates may be necessary as development and the installation of additional PFS software modules at Subaru progresses.

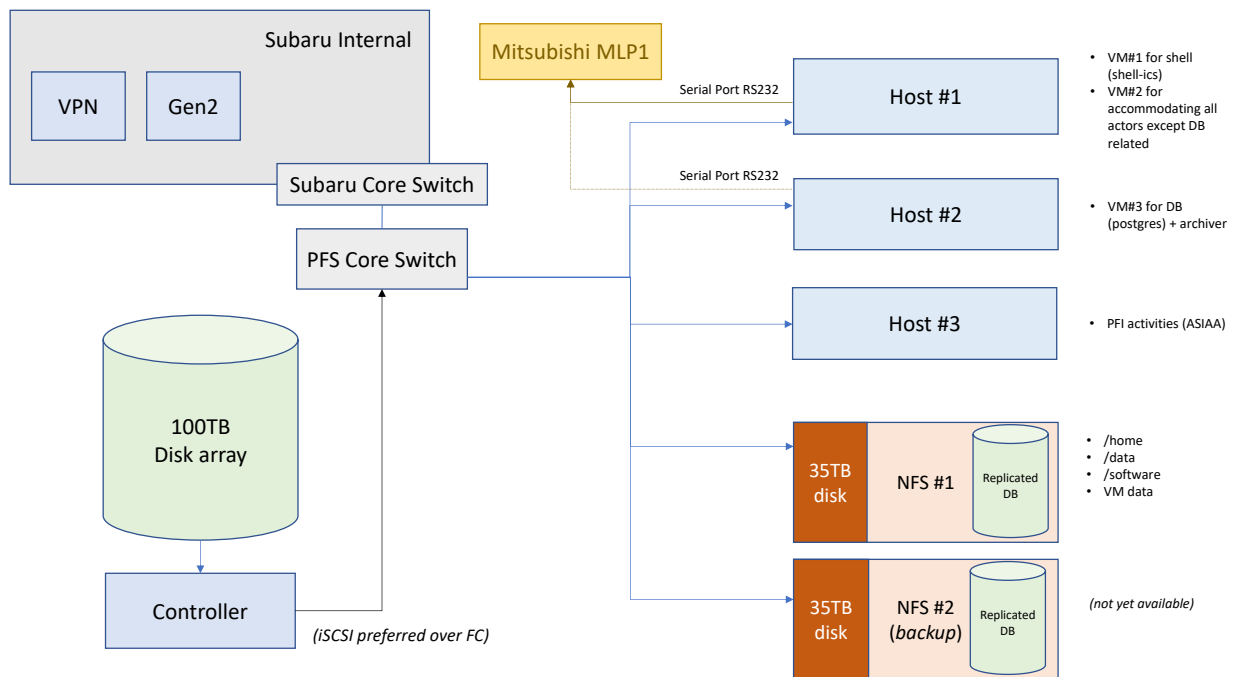


Figure 3: Target Configuration

## Target Hardware Configuration

- An alternative proposal for the future configuration has been proposed by P Tait (Subaru) and is shown in figure 4 below. This configuration provides a reduced number of servers, which reduces maintenance. This is currently under discussion.

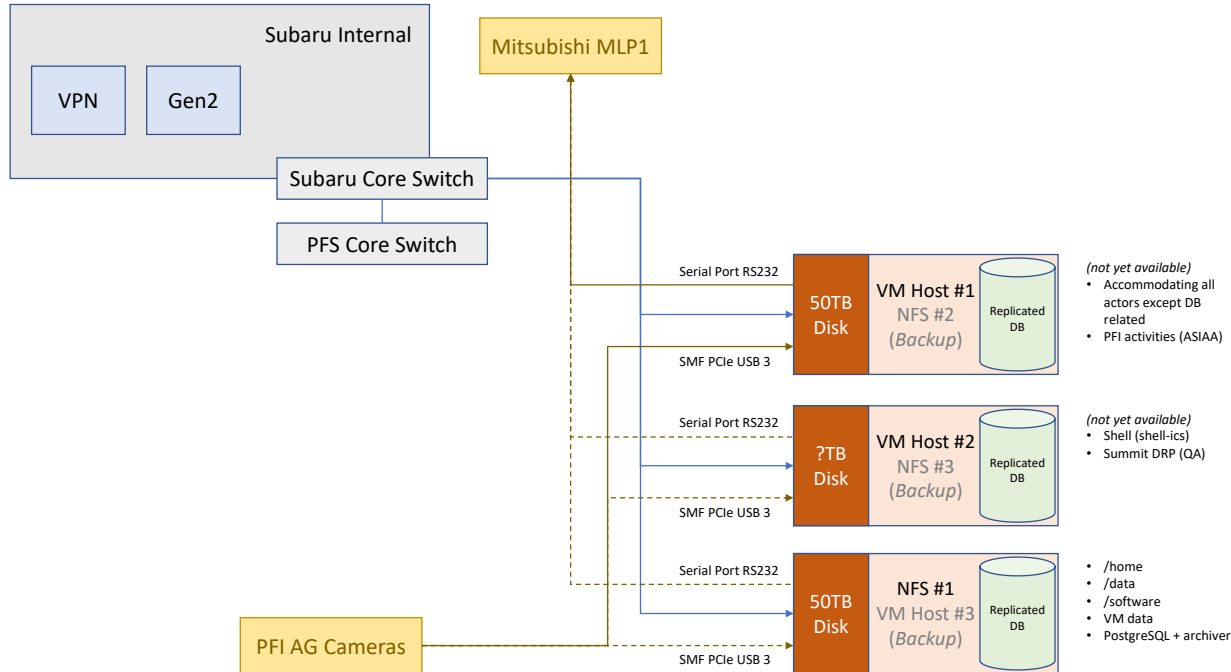


Figure 4: Alternative proposal

## Open points

1. The 35TB (physical size = 60TB; effective capacity = 35TB) disk arrays on NFS#1 and #2 are still to be confirmed, pending on the number of slots available, and cost.
2. New hardware and corresponding support need to be purchased. Is there a cost impact at Subaru to accommodate this revised configuration?
3. The NFS #2 machine is not currently in place. It is to be discussed whom is the responsible to purchase this (Subaru or PFS) and subsequently when it will be available.
4. Prefer iSCSI links as opposed to FC – it is felt that the former is more robust, an anecdotal illustration was provided following the change on 2018-04-23. But this is not a strong request. This admittedly may introduce a performance penalty.