FISH PASSAGE CENTER

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MEMORANDUM

TO: Jim Ruff, NPCC
Nancy Leonard, NPCC
Adam Gittler, ACME Consulting

FROM: Michele DeHart

DATE: February 13, 2015

RE: Fish Passage Center Web Site Structure

In response to your request, the Fish Passage Center (FPC) staff has developed the following brief description of the FPC Web site structure and tools.

The FPC Web site is controlled by a series of four computers: WebFarmControl, Swordfish, Swordfish2 and Swordfish3. This configuration is known as a server farm.

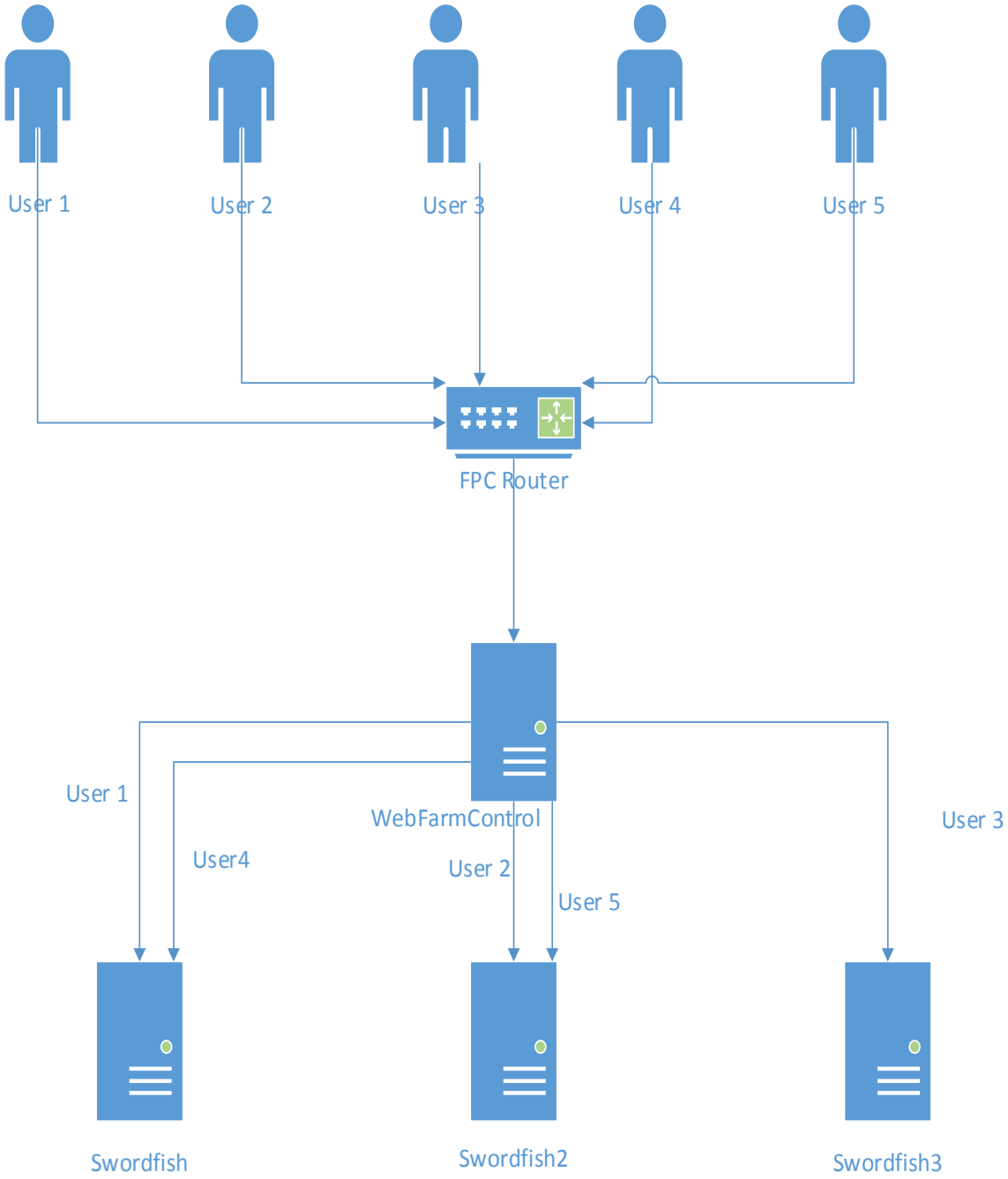
A server farm is a group of computers acting as servers and housed together in a single location. A server farm is sometimes called a server cluster. A Web server farm can be either (1) a Web site that has more than one server, or (2) an Internet service provider that provides Web hosting services using multiple servers.

In a business network, a server farm or cluster might perform such services as providing centralized access control, file access, printer sharing, and back-up for workstation users. The servers may have individual operating systems or a shared operating system and may also be set up to provide load balancing when there are many server requests. In a server farm, if one server fails, another can act as back-up.

On the Internet, a Web server farm, or simply Web farm, may refer to a Web site that uses two or more servers to handle user requests. Typically, serving user requests for the files (pages) of a Web site can be handled by a single server. However, larger Web sites may require multiple servers.

Web farm is a term that is also used simply to mean a business that performs Web site hosting on multiple servers.

The reason we use this format is to allow better access to our Web site during peak demand times. The way this works is you have a main sever, in our case WebFarmControl, which acts like a traffic cop. When a request to access our Web site is initiated it looks at the request and sends it to one of the other three servers. When the next request arrives it is directed to another server, and so on. This technique is called load balancing.



The servers are exact duplicates of each other as far as software and data stored on each, so changes have to be made on only one of them and it will automatically get updated on the others. The main server (WebFarmControl) monitors the others and when it detects changes it distributes the change to the other computers in the group.

The servers are configured as follows:

WebFarmControl

- Intel Core i3 540 3.07 GHz
- Windows Server 2008 R2 Ent, SP 1.0
- 16 GB Ram
- 1 TB hard drive

Swordfish

- Intel Core 2 Duo 3.0 GHz Processor
- Windows Server 2008 R2 Ent, SP 1.0
- 8 GB Ram
- 500 GB hard drive—Operating System
- 1 TB hard drive—Web site data

Swordfish2

- Intel Core 2 Duo 2.93 GHz Processor
- Windows Server 2008 R2 Ent, SP 1.0
- 8 GB Ram
- 500 GB hard drive—Operating System
- 1 TB hard drive—Web site data

Swordfish3

- Intel Core 2 Duo 2.66 GHz Processor
- Windows Server 2008 R2 Ent, SP 1.0
- 8 GB Ram
- 150 GB hard drive—Operating System
- 150 GB hard drive—Web site data

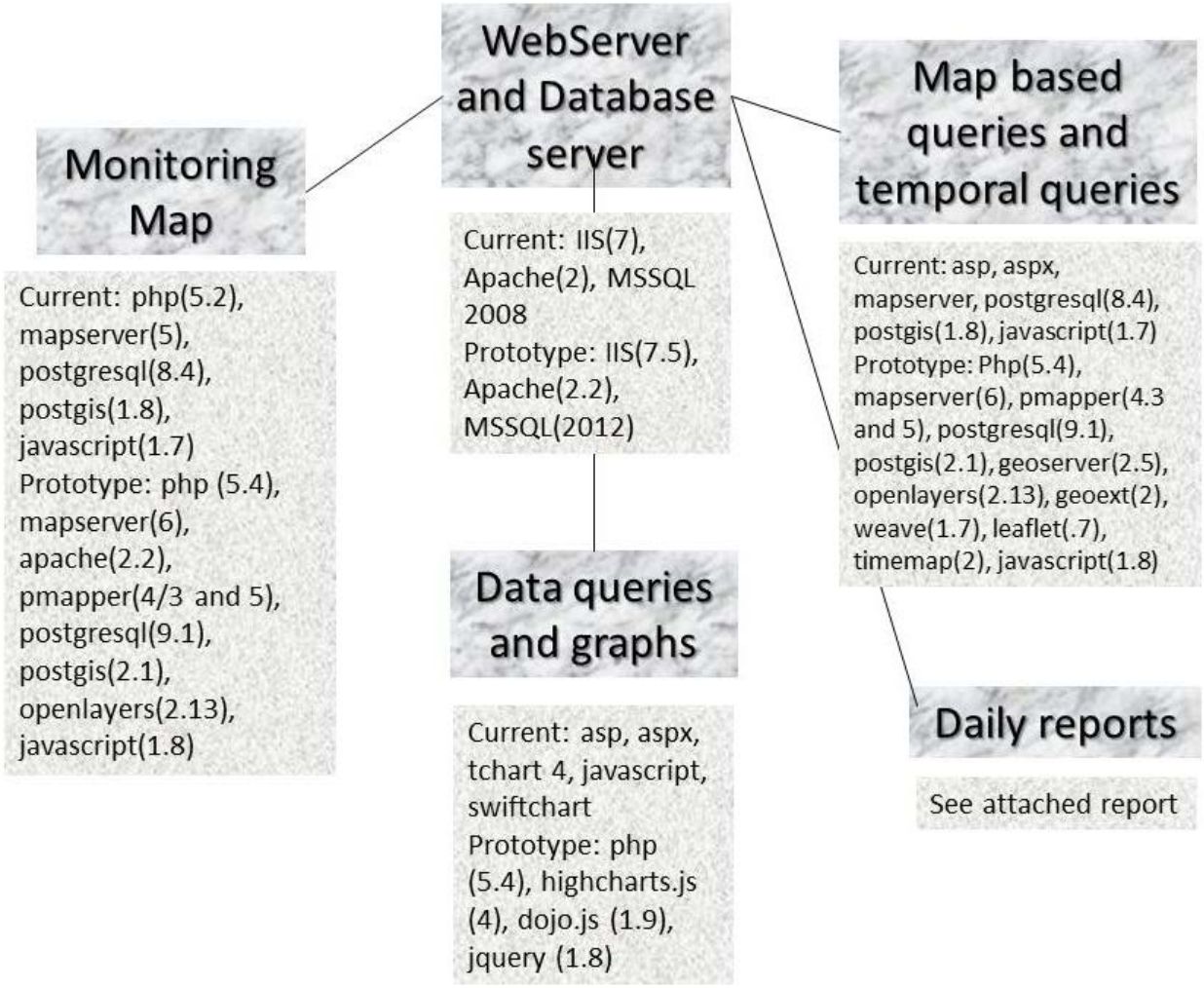
FPC.org Web Site Software Stacks

The FPC Web site consists of four main components: (1) the Web server and database, (2) the monitoring map application and spatial data software stack, (3) map-based queries, and (4) data queries and graphs. The Web server software sends our Web pages to our audience and the database server holds the salmon and river data that is used in the daily reports, data queries and graphs. Our current Web server software is Microsoft IIS 7 and Apache 2.0. Our current database server runs Microsoft SQL 2008. We are in the process of updating our Web site and have developed some prototype applications using different software stacks. For instance, the Web servers for the prototype applications are Apache 2.2 and Microsoft SQL 2012.

On our current Web site, we have a monitoring map application designed to allow users to spatially search for hatcheries and their associated release sites. The map zooms to the extent of the selected hatchery and its associated release sites, and allows the user to download release data. The software stack for the hatchery map application is: php (5.2), mapserver (5), postgresql (8.4), postgis (1.8), javascript (1.7). We have developed a prototype monitoring map application which includes additional monitoring sites such as weirs, dams, traps, redd sites, redd transects, PIT-tag sites, and Comparative Survival Study (CSS) tag and release sites. The application also includes important salmon distribution information or significant salmon geographical features (i.e., streams containing salmon, evolutionary significant units, major population groups, populations and spawning areas). This application allows the user to spatially search for monitoring sites within the salmon geographical areas, and link to graph queries with additional data for selected sites or directly download data. The software stack for the prototype monitoring map application is: php (5.4), mapserver (6), Apache (2.2), pmapper (4/3 and 5), postgresql (9.1), postgis (2.1), openlayers (2.13) and javascript (1.8).

Our Web site has many queries which can be used to graph and download program information. Areas of available information include the smolt monitoring program, hatchery data, comparative survival data, adult dam count data, river flow and spill data, spawning data, and other data including documents written by the FPC staff (annual reports, weekly reports, memorandums, system operations requests, joint technical memorandums, fish passage facility reports, etc.). The software used on our current Web site includes: asp, aspx, tchart 4, javascript and swiftchart. We have developed several prototype data queries using newer components which allow users to interactively see individual chart data values, turn off/on a data series, download charts in several formats, sort table columns, print tables, and allow for table pagination. These prototypes enhance interactive form elements and data validation. The software stack used in these prototype data and graph queries includes: php (5.4), highcharts.js (4), dojo.js (1.9) and jquery (1.8).

In addition to graph-based queries, we have several map-based queries that allow users to map and download specific datasets (e.g., number of PIT-tagged CSS fish released by site, CSS annual in-river estimates by river segment, etc.). The software stack for the current map-based queries includes: asp, aspx, mapserver, postgresql (8.4), postgis (1.8) and javascript (1.7). We have developed several new map-based queries and temporal queries. These prototype queries allow users to spatially map, graph, and select either salmon species geographies (with a display of related data such as abundance, survival, etc.) or specific monitoring locations (with related data such as hatchery releases, river segments with survivals, etc.). Some of these queries are also temporal queries, allowing the user to see how the data changes spatially over time. The software stack used for these queries includes: php (5.4), mapserver (6), pmapper (4.3 and 5), postgresql (9.1), postgis (2.1), geoserver (2.5), openlayers (2.13), geoext (2), weave (1.7), leaflet (.7), timemap (2) and javascript (1.8).



We post daily reports (and some other queries) on our Web site about smolt abundance; condition and survival; river flow and spill; adult dam counts; and other reports. These reports use a different software stack. See the attached *Web Projects* report for specific information on these applications.