

The University of the South Pacific

FJ Domain, PKI, DNS Security, IPv6 Opportunities

PACNOG 28 - Online

Welcome

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IT Services

Agenda

- History - FJ Domain
- Challenges
- PKI
- DNS Security
- Platform Upgrade
- Opportunities
- Future

General Overview

The Journey

About USP

- FJ Domain
 - IANA delegated FJ to USP in 1990.
 - Registration of clients started in 1991.
- Delegation
 - school.fj TFL
 - gov.fj ITC
 - govnet.fj ITC
- The first organization in Fiji to use Internet.
- Initial Platform
 - Red Hat Linux
 - Perl & PHP
 - Development In-House

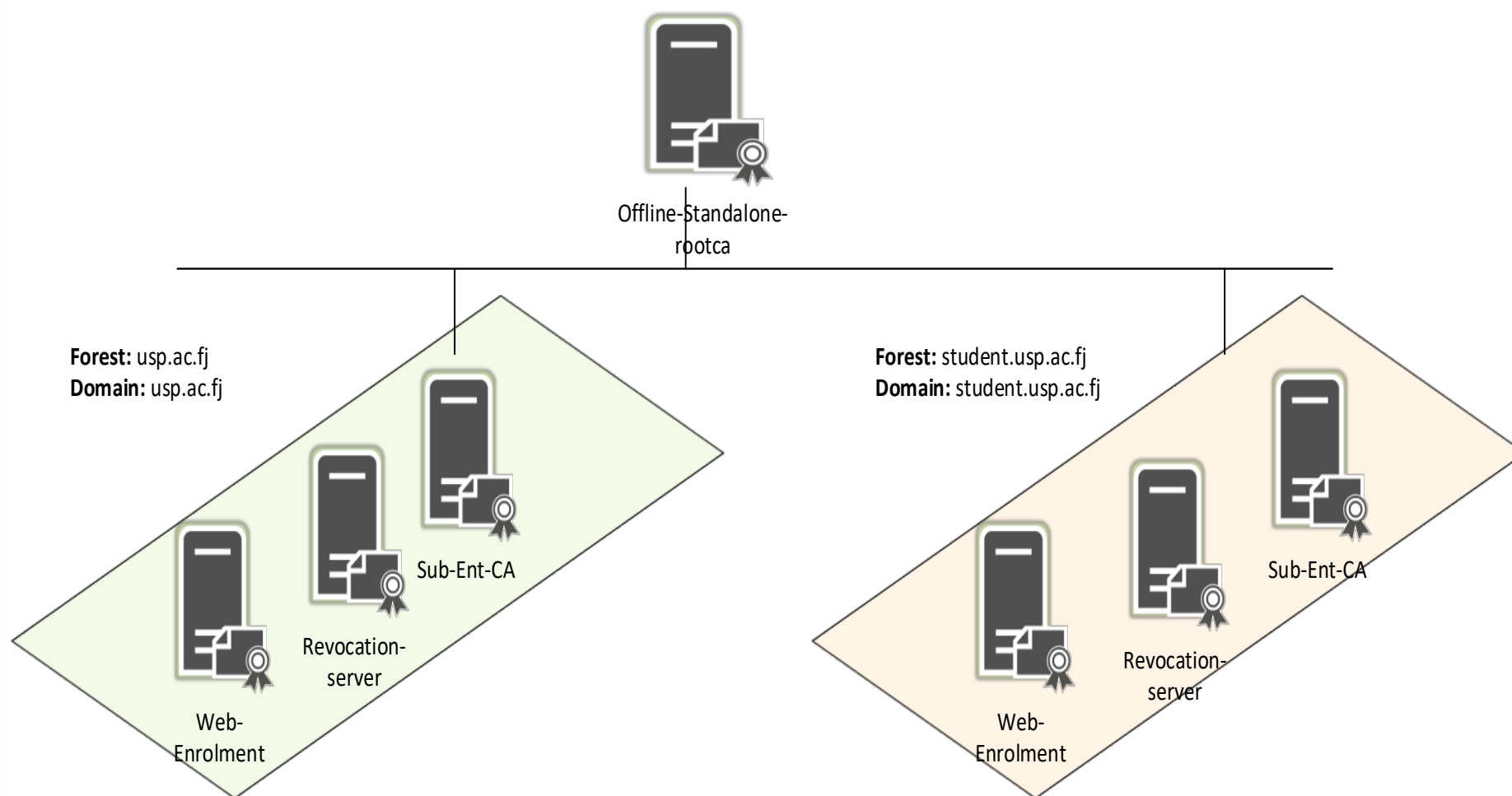
Challenges

- Updating Linux OS
 - Application Patching
 - Knowledge Transfer
 - Documentation
- Global Partners
 - Replication
- Online Services
 - No customer portal
 - No payment gateway services
- Networking
 - TLD Standards
 - Policies
 - Technology Trends
 - Service Offering
- Training
 - Technical Training
- Banging Heads
 - Technical Debates

PKI – Public Key Infrastructure

- Planning (Waisiki Ravula)
 - Windows 2012 AD Upgrade 2017
 - Windows 2016 PKI 2020
 - Windows 2019 AD Upgrade 2020
- PKI Features – Completed May 2020
 - Website Certificates
 - AD User & Computer Certificates
 - End to End Encryption
 - Document Signing
- DNS Security – Completed Feb 2021
 - Prelude was PKI
 - Deploy DNS Sec Internally
 - As we sign internally, we also need to sign FJ.

PKI Designs



IPv6 Deployment

- Redeployment in 2018 – Completed Dec 2019
- IPv6 Ready (Fiji)
 - All wireless services (Dual Stack)
 - All Staff and Student LAN
 - Server Subnets (All Except AD)
 - Services (Working on It)
- Pending
 - WAN Sites (IPv4)
 - NAT 6 to 4 and vise versa
 - ISP Considerations

IPv6 Users by Country

Index	ISO-3166 Code	Internet Users	V6 Use ratio	V6 Users (Est)	Population	Country
1	UM	0	95.83	0	0	United States Minor Outlying Islands
2	YT	150048	69.05	103602	272815	Mayotte
3	IN	583504313	61.4	358254167	1380004385	India
4	BE	10417994	58.69	6114482	11589623	Belgium
5	BL	5103	58.39	2979	9279	Saint Barthelemy
6	US	250058937	57.28	143225029	331002651	United States of America
7	MY	27847051	48.14	13405660	32365999	Malaysia
8	GR	7520062	47.76	3591947	10423054	Greece
9	DE	70713647	47.48	33576787	83783942	Germany
10	TW	25932758	43.88	11378804	23816775	Taiwan
11	VN	53442603	40.62	21708771	97338579	Vietnam
14	JP	113144252	37.27	42170198	126476461	Japan
23	AE	9860757	30.7	3027286	9890402	United Arab Emirates
32	AU	22336713	25.78	5757915	25499884	Australia
97	FJ	505070	0.34	1729	896445	Fiji

(APNIC, 2020)

<https://labs.apnic.net/dists/v6dcc.html>

Technical Project – .FJ Domain Services

The Grind

Presented Also in PACNOG 26

Application Layer Security and Features

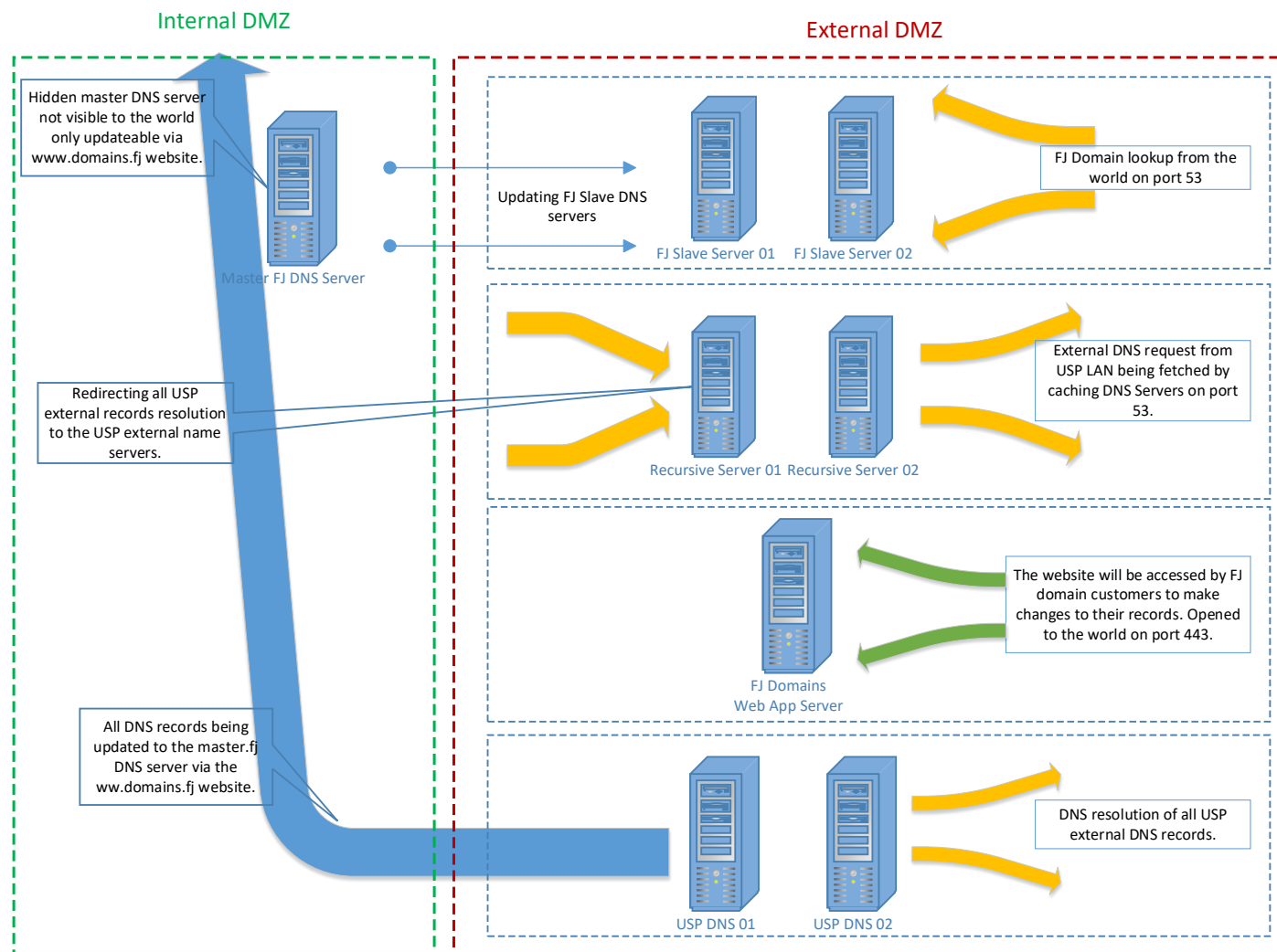


- **Fiji Economy**
 - Safeguard the FJ domain Platform
 - Ability to integrate DNS Security into the system
- **Internal Audits**
 - Multiple role-based user types to manage user privileges.
 - Encryption of credentials using best practices (Hash, Salt and Stretch)
 - Web Portal access secured by IP address, captcha and two-factor authentication.
 - Ability to force a periodic password reset.
- **Customer Services**
 - Password validity period based on the complexity of password and age, not simply age.
 - Browser fingerprinting to capture suspicious activity.
 - Full log of all user activity.
 - Automated billing and better analytics.
 - Read Only law enforcement access.

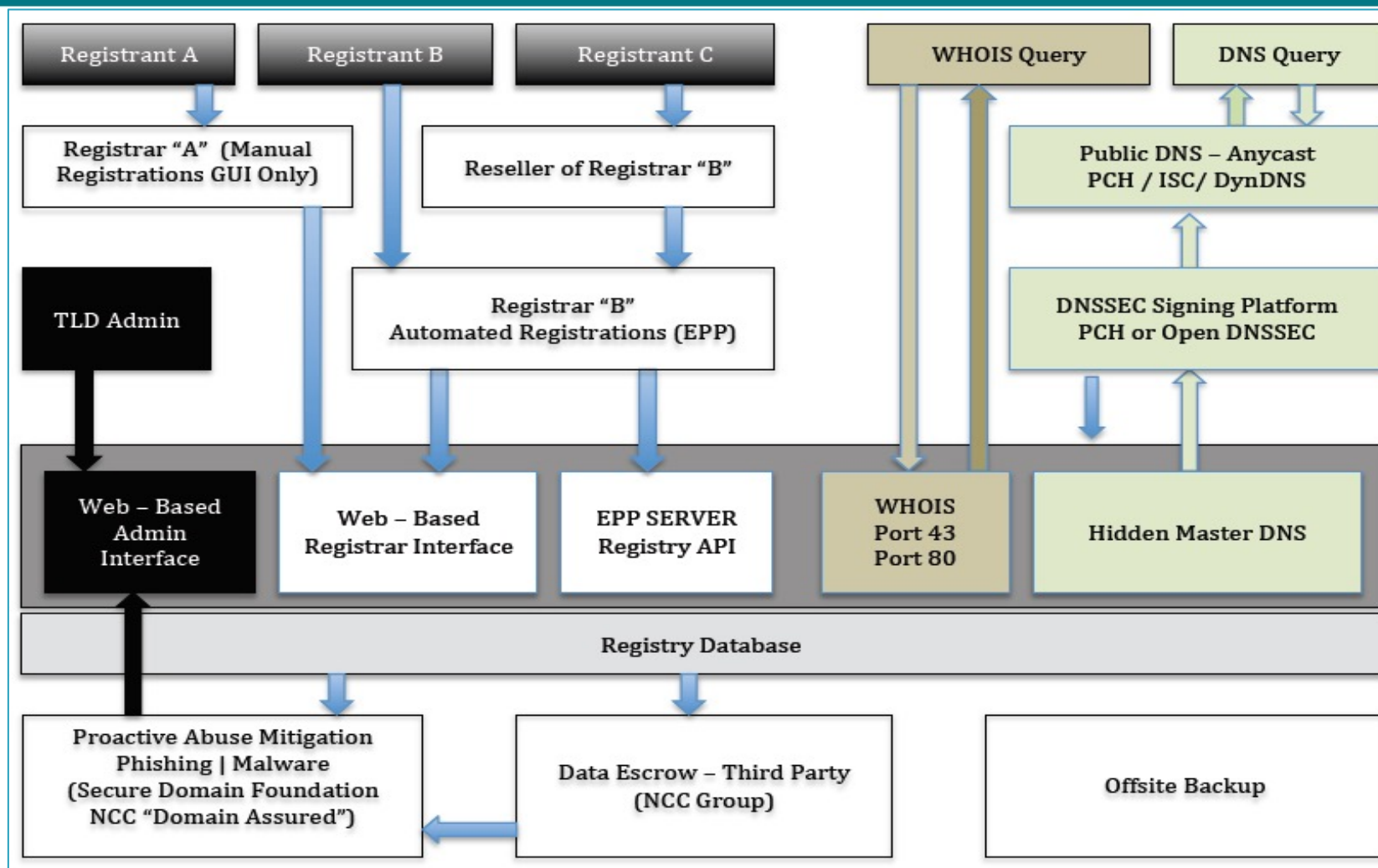
continued

- Global Standards
 - EPP Compliant (RFCs 5910, 5730, 5731, 5732, 5733 and 5734.)
 - IDN Compliant (RFCs 5890, 5891, 5892 and 5893.)
 - WHOIS Compliant (RFC 3912)
 - DNS – Compliance.
 - DNSSEC – Compliance.
 - IPV6 – Compliance.
 - Escrow – Compliance.
- Proactive Abuse Mitigation
 - Integration with Secure Domain Foundation “Luminus” (a reputation and validation API which allows users to quickly identify potential abuse). <https://securedomain.org/>

FJ Domain & DNS Sec Design



Work Flow



End Result

Name Servers

This is the list of authoritative name servers used to service the domain on the Internet, to be listed in the DNS Root Zone.

ns4.fj	185.28.194.194	
ns1.fj	144.120.146.1	2402:2940:100:100c:0:0:0:1
ns2.fj	144.120.146.65	2402:2940:100:100d:0:0:0:1
ns5.fj	204.61.216.138	
ns3.fj	185.38.108.108	

[Update Name Servers ►](#)

Delegation Signer Records

These are the secure delegation signer records used to enable the chain of trust for DNSSEC-signed domains.

18952 [REDACTED]

[Update DS Records ►](#)

Additional Information

This information is published in the Root Zone Database and/or IANA website to assist customers in finding information about the top-level domain.

Registration URL: <http://domains.fj/>

WHOIS Server: —

RDAP Servers: —

[Update Additional Info ►](#)



Domain Launched



← → ↻ 🏠 🔒 domains.fj

.fj Domain Registry Services | WEDNESDAY, JUNE 23, 2021

MENU

- Home
- Announcements
- Contact Us

Begin the search for your perfect domain name

eg. example.com **Search**

Please enter the characters you see in the image below into the text box provided. This is required to prevent automated submissions.

73X56S

- <https://www.domains.fj/>
- Self Service Portal



Portal Services



Lost Password Reset

Please enter your desired new password below.

New Password

Confirm New Password

Password Strength

Tips for a good password



Use both upper and lowercase characters
Include at least one symbol (# \$! % & etc...)
Don't use dictionary words

Save Changes

Cancel



Welcome to FJ Domain Registry Services

Please click on the link below to verify your email address. This is required to confirm ownership of the email address.

[Verify your email address](#)

If you're having trouble, try copying and pasting the following URL into your browser:
<https://www.domains.fj/index.php/user/verify/164413e7d703ddf953054a236bdcdd a3735b3cafee287197d49ad59965bbe17f>



MONDAY, JUNE 21, 2021



Primary



Social **5 new**



Promoti... **8 new**



Update

<input type="checkbox"/>			FJ Domain Registry .	Invoice Payment Confirmation - FJ Domain Registry Ser
<input type="checkbox"/>			FJ Domain Registry .	Domain Registration Confirmation - FJ Domain Registry
<input type="checkbox"/>			FJ Domain Registry .	Customer Invoice - FJ Domain Registry Services Dear E
<input type="checkbox"/>			FJ Domain Registry .	Welcome - FJ Domain Registry Services Dear Edwin, Tha
<input type="checkbox"/>			FJ Domain Registry .	Email Address Verification - FJ Domain Registry Service

Order Confirmation

Thank you for your order. You will receive a confirmation email shortly.



Your Order Number is: 3763648546

If you have any questions about your order, please open a support ticket from your client area and quote your order number.

[Continue To Client Area](#)



Domain Features



.fj Domain Registry Services



WEDNESDAY, JUNE 23, 2021



MENU

Home

Domains

My Domains



Portal Home → Client Area → My Domains

Domain:

edwin.ac.fj

Registration Date:

Monday, June 21st, 2021

Next Due Date:

Tuesday, June 21st, 2022

Status:

Active

SSL Status

No SSL Detected

First Payment Amount:

\$100.00FJD

Recurring Amount:

\$60.00FJD Every 1 Year/s

Payment Method:

Payment Express



Auto



☒ Use custom nameservers (enter below)

Nameserver 1

ns1.fj

Nameserver 2

ns2.fj

Nameserver 3

Command completed successfully

Nameserver 4

Nameserver 5

Change Nameservers

What would you like to do today?

- [Change the nameservers your domain points to](#)
- [Update the WHOIS contact information for your domain](#)
- [Change the registrar lock status for your domain](#)
- [Renew Your Domain](#)



User Account Management

Email Address / Last Login

ewsandys@gmail.com
Last Login: 4 minutes ago

* Account owners always have full permissions over a client account.

Invite New User

Inviting a new user allows you to be able to create one.

name@example.com

☐ All Permissions ☒ Choose Permissions

- ☐ Modify Master Account
- ☐ View & Manage Content
- ☐ View Products & Services
- ☐ View & Modify Products
- ☐ Perform Single Sign-On
- ☐ View Domains - View
- ☐ Manage Domain Settings
- ☐ View & Pay Invoices - View
- ☐ View & Accept Quote
- ☐ View & Open Support Tickets
- ☐ View & Manage Affiliates
- ☐ View Emails - Access
- ☐ Place New Orders/Updates

Send Invite

Login

Email Address

wravula@gmail.com

Password

Password

Register

First Name

Waisiki

2 Users Found

Email Address / Last Login

Actions

ewsandys@gmail.com **Owner** 
Last Login: 14 minutes ago

Manage Permissions

Remove Access

wravula@gmail.com 
Last Login: 3 minutes ago

Manage Permissions

Remove Access

* Account owners always have full permissions over a client account.

submissions.

AEBYTM

AEBYTM

Register

The Future

Solutions

FJ Domain

- Business Continuity
 - With the new platform in place and updated documentation for application developers.
 - We can ensure the continued sustainability of the solution progressing into the future.
- Additional Services
 - API integration
 - Offer SSL Certificates (Recall PKI)
 - Registrar Inclusivity (Connect and Fiji ITC)
- Policies
 - Improve Policies and FJ Domain Guidelines

FJ Domain Cont

- Security Enhancements
 - Next Phase: USP Internal DNS Sec Integration
 - Encourage Online Business
 - Offer Certificate Services
- IANA & ICANN Alignment
 - Alignment of FJ Registry to current protocols required by IANA and ICANN for global registries.
 - Request for Review / Validation

Cool Stuff

- Office 365
 - Exchange Service
 - Office Apps
- VMWare Virtual Services
 - Virtual Desktop Infrastructure
 - VMWare Application Containers: <https://vapps.usp.ac.fj>
- Others
 - Complete RPKI (Attempted in 2020)
 - Routing Upgrade (SDWAN Ready)
 - Cloud Services (Security & Service Availability)
 - Automate processes & ease operations
 - Improving Security Community
 - PACREN

Thank You & Questions

We do things right, our people stay
connected!

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edwin.sandys@usp.ac.fj