

PFS-CLOUD

2018

SERVICE DESCRIPTION



Pacific Fund Systems Ltd

Hong Kong
Australia

United Kingdom
Isle of Man

Email information@pacificfundsystems.com

1. PFS-CLOUD – Service Overview

PFS-CLOUD is a Software as a Service (SaaS) provided by Pacific Fund Systems ('PFS') which allows customers to access **PFS-PAXUS**, **PFS-CONNECT** and **PFS-DataFeed** hosted in the Cloud. The service is available 24/7 using a Microsoft Windows or Mac OSX device using Citrix Receiver via the majority of internet browsers.

PFS-CLOUD provides access to the latest version of **PFS-PAXUS** and **PFS-CONNECT** on a multi-tenant database with all data maintained securely and privately.

PFS release a new version of our products every six months. Once a new version is released customers will have access to a test environment for a period of 6 weeks which will allow them to test the new version. After 6 weeks, the live production version is automatically upgraded to the latest release. Patches – including any minor updates and fixes between each full release will be automatically applied both to the production and the test environment platforms.

PFS-CLOUD offers the following functionalities, in addition to the features included in **PFS-PAXUS**, **PFS-CONNECT** and **PFS-DataFeed**:

- ✓ Hosting solution based on Microsoft Azure with access to high-performance servers and Premium SSD storage
- ✓ A single multi-tenant SQL Server database for efficient maintenance and upgrades
- ✓ Host web server for PFS-CONNECT on the same Microsoft Azure infrastructure with an option to white label the portal
- ✓ Robust delivery of investor communications and automated internal emails using SendGrid® SMTP service
- ✓ High network bandwidth for fast access to the service (dependency on local connectivity)
- ✓ Remote application publishing using Enterprise grade Citrix XenApp® and Citrix Workspace Environment Management® for best of breed user experience
- ✓ Security assurances over highly sensitive database information through data encryption during transfer and at rest (on disk storage) to help with GDPR requirements
- ✓ Multi-Factor Authentication access to Citrix StoreFront®
- ✓ Disaster Recovery system (DR) will redirect all users connections to another data centre in case of major disaster (earthquakes, flood, etc.)
- ✓ Daily database backup are retained daily for one month, monthly for 12 months, and yearly for seven years
- ✓ Native Azure infrastructure backups are kept daily for seven days and weekly for eight weeks
- ✓ Real-time systems and security monitoring with 24-7 technical support for **PFS-CLOUD**
- ✓ Disaster Recovery system (DR) will redirect all users connections to another data centre in case of major disaster (earthquakes, flood, etc.)



Pacific Fund Systems Ltd

Hong Kong United Kingdom
Australia Isle of Man
Email information@pacificfundsystems.com

- ✓ One month trial account available to test the service
- ✓ Two environments with different databases:
 - Production
 - UAT / Test

2. BENEFITS

COST – **PFS-CLOUD** is a subscription-based service. You do not have any capital costs, nor any operating and administration costs; **this allows for simpler budgeting and predictable monthly costs.**

SCALE – The underlying IT infrastructure can be scaled if workloads increase. **Taking the pressure off capacity planning.**

PERFORMANCE – Powered by Microsoft Azure Cloud services, your data remains on leading-edge hardware. **You will always get the highest level of performance.**

PRODUCTIVITY – You do not have to download or install any patches. You automatically get all the latest features, software releases, updates and bug fixes. We manage all updates and upgrades for you. You no longer have to worry about hardware requirements and setup, operating systems, patching and other time-consuming IT management everyday jobs. **PFS-CLOUD** removes the need for all these tasks, **taking this time-consuming burden and operational cost off your organisation.**

RELIABILITY – We securely store your data as we perform regular backups, meaning you always have a recent copy of all your work saved so **you do not have to worry about hardware failure or shutdowns.** On top of this your data is mirrored on a redundant site where you will be redirected in the event of a major failure or natural disaster, such as earthquakes, flood or other unforeseen issues in the primary hosting region.

EASE OF USE – **The service and your data are easily accessible, whether you are at home, in the office or travelling.** All you need to access the software is a Microsoft Windows or Mac OSX device and an internet connection.

LEADING EDGE TECHNOLOGY – You are assured that **PFS-PAXUS & PFS-CONNECT** will always run on a leading Cloud Platform. As Cloud technology evolves, **we will adapt the development of the software to take advantage of the latest Cloud developments for your benefit.**

CLOUD IS THE FUTURE – As technology gets more complex and systems such as **PFS-PAXUS** interface to multiple applications in real time using multiple layers of software, the cost of maintaining the environment in-house will increase. **With the Cloud model these costs are shared across all the users.**



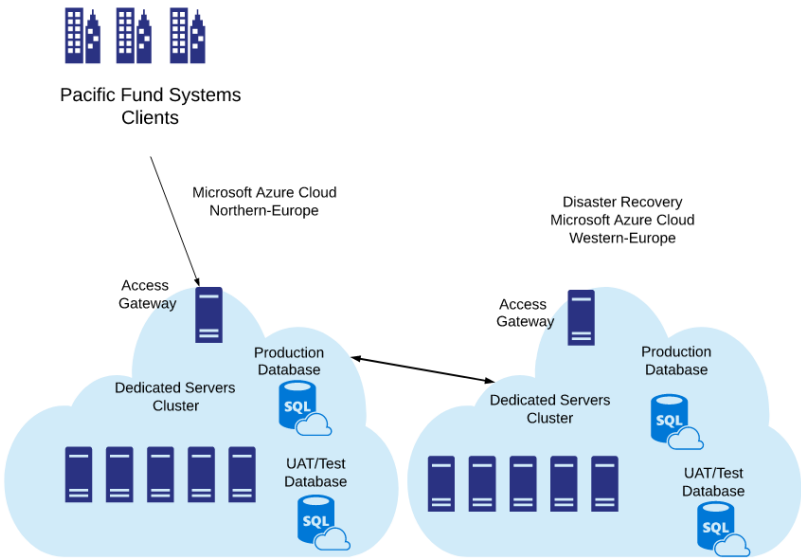
Pacific Fund Systems Ltd

Hong Kong United Kingdom
Australia Isle of Man
Email information@pacificfundsystems.com

3. SERVICE ARCHITECTURE

The platform consists of a cluster of Virtual Machines that deliver services to external end users as illustrated below:

- Initially located on the Microsoft Azure Cloud platform in Northern Europe region, with real-time failover in Western Europe
- Designed for optimal performance in an isolated network, with secure Citrix XenApp® access
- 24x7 availability incorporates multiple redundant measures to protect operations from power failure, physical intrusion and network outages



Third-party software is used to monitor the performance of the application as well as to provide Disaster Recovery services across regions of the Azure cloud.

We perform two types of backup, each with different retention periods:

Infrastructure Azure Native backup:

All of the disk images of all the Virtual Machines are backed up. An image backup may be used in the unlikely event that a total restore of the environment is required. Backups are taken daily for seven days and weekly for two months.

Database backups:

This is the SQL server backup of the database. We keep these backups daily for a month, monthly for a year and yearly for 7 years. A database backup can be used in the event that a restore of the database is required.

PFS-PAXUS, PFS-CONNECT and **PFS-PAXUS DataFeed** have been enhanced to work with both Azure and Citrix environments.



Pacific Fund Systems Ltd

Hong Kong United Kingdom
 Australia Isle of Man
 Email information@pacificfundsystems.com

4. PFS-CLOUD SECURITY

PFS-CLOUD is protected at multiple levels within the cloud infrastructure. Furthermore, the software is designed in a way to ensure a maximum level of security and protection against external threats.

- Backed up by Microsoft Azure and Citrix XenApp® we offer the highest level of security for your data:
 - Direct data centre access is limited to designated operational and technical personnel who have a defined business need to access the physical server infrastructure
 - Redundant power supplies with failover capability to a minimum of two alternative power sources, including power generation capability for off-grid operations
 - In addition, physical security controls are designed to “fail closed” during a power disruption to minimise the risk of any unauthorised access during a power outage
- Quarterly penetration tests performed by Trustwave, worldwide leader in cybersecurity
- Virtual network and firewalls
- Secure remote Multi-Factor Authentication access provided by Citrix XenApp®
- Strong encryption technologies during transfer and for data at rest
- Security real-time monitoring and event logging
- Disaster Recovery
 - A business continuity plan is in place that includes secure data backup and real-time disaster recovery (DR) via a secondary datacentre.

5. PFS-CLOUD SUPPORT

All hosting level connectivity (Citrix) and environment (Azure) enquiries will need to be raised via email to PFSCloudSupport@rfa.com . This service is monitored and available 24/7/365.

Queries in relation to **PFS-PAXUS**, **PFS-CONNECT** and **PFS-PAXUS Datafeed** should be submitted via the PFS Support website www.pfssupport.com and will be subject to the normal support terms as outlined in the Maintenance Agreement.

6. SERVICE LEVEL AGREEMENTS

6.1 PFS-CLOUD Service Availability

The **PFS-CLOUD** service will be available 24/7 except for any planned maintenance downtime, for which all customers will be duly notified, and temporary outage in the event of a disaster situation during the switch over to the DR server.

6.2 Recovery Time

In the event of a disaster that results in the total shutdown of server access, the recovery time objective for restored access shall be no greater than eight (8) hours. However, as we have



Pacific Fund Systems Ltd

Hong Kong United Kingdom
Australia Isle of Man
Email information@pacificfundsystems.com

implemented a real-time disaster recovery platform, the switch from the Azure platform to the Disaster Recovery platform will be performed in a matter of minutes.

6.3 PFS-CLOUD Help Desk Response time

LEVEL	DESCRIPTION	RESPONSE TIME
CRITICAL	An issue which effects the entire SaaS Platform and all Supplier Customers (i.e. servers down, no connectivity)	30 MINUTES
HIGH	A single issue which effects all Users of the Customer	60 MINUTES
MEDIUM	An issue effecting any singular User	8 HOURS

- We aim to respond to all enquiries within thirty (30) minutes.



Pacific Fund Systems Ltd

Hong Kong United Kingdom
Australia Isle of Man
Email information@pacificfundsystems.com

PFS-CLOUD

2018

Q&A



Pacific Fund Systems Ltd

Hong Kong
Australia

United Kingdom
Isle of Man

Email information@pacificfundsystems.com

PFS-CLOUD Questions and Answers

1. What is **PFS-CLOUD**; what are the main features?

PFS-CLOUD is a Software as a Service (SaaS) provided by Pacific Fund Systems ('PFS') which allows customers to access **PFS-PAXUS**, **PFS-CONNECT** and **PFS-Datafeed** hosted in the Cloud. The service is available 24/7 using a Microsoft Windows or Mac OSX device using Citrix Receiver via the majority of internet browsers.

PFS-CLOUD provides access to the latest version of **PFS-PAXUS** and **PFS-CONNECT** on a multi-tenant database with all data maintained securely and privately.

PFS release a new version of our products every six months. Once a new version is released customers will have access to a test environment for a period of 6 weeks which will allow them to test the new version. After 6 weeks, the live production version is automatically upgraded to the latest release. Patches – including any minor updates and fixes between each full release will be automatically applied both to the production and the test environment platforms.

PFS-CLOUD offers the following functionalities, in addition to the features included in **PFS-PAXUS**, **PFS-CONNECT** and **PFS-DataFeed**:

- ✓ Hosting solution based on Microsoft Azure with access to high-performance servers and Premium SSD storage
- ✓ A single multi-tenant SQL Server database for efficient maintenance and upgrades
- ✓ Host web server for **PFS-CONNECT** on the same Microsoft Azure infrastructure with an option to white label the portal
- ✓ Robust delivery of investor communications and automated internal emails using SendGrid© SMTP service
- ✓ High network bandwidth for fast access to the service (dependency on local connectivity)
- ✓ Remote application publishing using Enterprise grade Citrix XenApp© and Citrix Workspace Environment Management© for best of breed user experience
- ✓ Security assurances over highly sensitive database information through data encryption during transfer and at rest (on disk storage) to help with GDPR requirements
- ✓ Multi-Factor Authentication access to Citrix StoreFront©
- ✓ Disaster Recovery system (DR) will redirect all user connections to another data centre in case of major disaster (earthquakes, flood, etc.)
- ✓ Daily database backups are retained daily for two weeks, monthly for one year and yearly for seven years



Pacific Fund Systems Ltd

Hong Kong United Kingdom
Australia Isle of Man
Email information@pacificfundsystems.com

- ✓ Native Azure infrastructure backups are kept daily for seven days and weekly for eight weeks
- ✓ Real-time systems and security monitoring with 24-7 technical support for **PFS-CLOUD**
- ✓ One-month trial account available to test the service
- ✓ Two environments with different databases:
 - Production
 - UAT / Test

2. What is SaaS exactly?

SaaS, or Software-as-a-Service, is the concept of delivering software without having to account for the hardware and software components of hosting such software. In order to increase adoption, software providers have worked closely with hardware to create an easy consumption model.

As a SaaS provider, we take care of the infrastructure behind the application, keeping the operating systems, databases, libraries and software up to date. SaaS aims to provide you with the best performance, availability and security practices so you can focus on your business.

3. What is the difference between **PFS-CLOUD** and **PFS-HOSTING**?

PFS-HOSTING is a contract that is only available to Pacific Fund Systems customers who already have a perpetual license and a maintenance agreement. By subscribing to **PFS-HOSTING** for an additional monthly fee, existing Perpetual license customers get full access to the functionalities provided by **PFS-CLOUD**. In other words:

$$(\text{PFS-PAXUS} / \text{PFS-CONNECT}) + (\text{PFS-Maintenance}) + (\text{PFS-HOSTING}) = \text{PFS-CLOUD}$$

4. We use a local Cloud Provider to host **PFS-PAXUS**. Could we host **PFS-PAXUS** on your cloud platform and benefit from the economy of scale that you may realise?

If you are already a PFS customer, the **PFS-HOSTING** service offers a way to get access to the same functionalities provided by **PFS-CLOUD** for an affordable additional monthly fee. By default **PFS-HOSTING** only provides access to the latest version of **PFS-PAXUS** on a multi-tenant database.

5. I am already a Pacific Fund Systems customer; how long will it take to migrate to **PFS-CLOUD**?

Pacific Fund Systems will take care of the migration of your database to the cloud. This can be realised over a weekend. Once your database has been migrated, and new users have been created you can immediately access **PFS-CLOUD**.



Pacific Fund Systems Ltd

Hong Kong United Kingdom
 Australia Isle of Man
 Email information@pacificfundsystems.com

6. What are the main benefits of PFS-CLOUD?

- ✓ **COST** – **PFS-CLOUD** is a subscription-based service. You do not have any capital costs, nor any operating and administration costs; **this allows for simpler budgeting and predictable monthly costs.**
- ✓ **SCALE** – The underlying IT infrastructure can be scaled if workloads increase. **Taking the pressure off capacity planning.**
- ✓ **PERFORMANCE** – Powered by Microsoft Azure Cloud services, your data remains on leading-edge hardware. **You will always get the highest level of performance.**
- ✓ **PRODUCTIVITY** – You do not have to download or install any patches. You automatically get all the latest features, software releases, updates and bug fixes. We manage all updates and upgrades for you. You no longer have to worry about hardware requirements and setup, operating systems patching and other time-consuming IT management everyday job. **PFS-CLOUD** removes the need for all these tasks, **taking this time-consuming burden and operational cost off your organisation.**
- ✓ **RELIABILITY** – We securely store your data as we perform regular backups, meaning you always have a recent copy of all your work saved so **you do not have to worry about hardware failure or shutdowns.** On top of this your data is mirrored on a redundant site where you will be redirected in the event of a major failure or natural disaster, such as earthquakes, flood or other unforeseen issues in the primary hosting region.
- ✓ **EASE OF USE** – The service and your data are **easily accessible, whether you are at home, in the office or travelling.** All you need to access the software is a Microsoft Windows or Mac OSX device and an internet connection.
- ✓ **LEADING EDGE TECHNOLOGY** – You are assured that **PFS-PAXUS** & **PFS-CONNECT** will always run on a leading Cloud Platform. As Cloud technology evolves, **we will adapt the development of the software to take advantage of the latest Cloud developments for your benefit.**
- ✓ **CLOUD IS THE FUTURE** – As technology gets more complex and systems such as **PFS-PAXUS** interface to multiple applications in real time using multiple layers of software, the cost of maintaining the environment in-house will increase. **With the Cloud model these costs are shared across all the users.**



Pacific Fund Systems Ltd

Hong Kong United Kingdom
Australia Isle of Man
Email information@pacificfundsystems.com

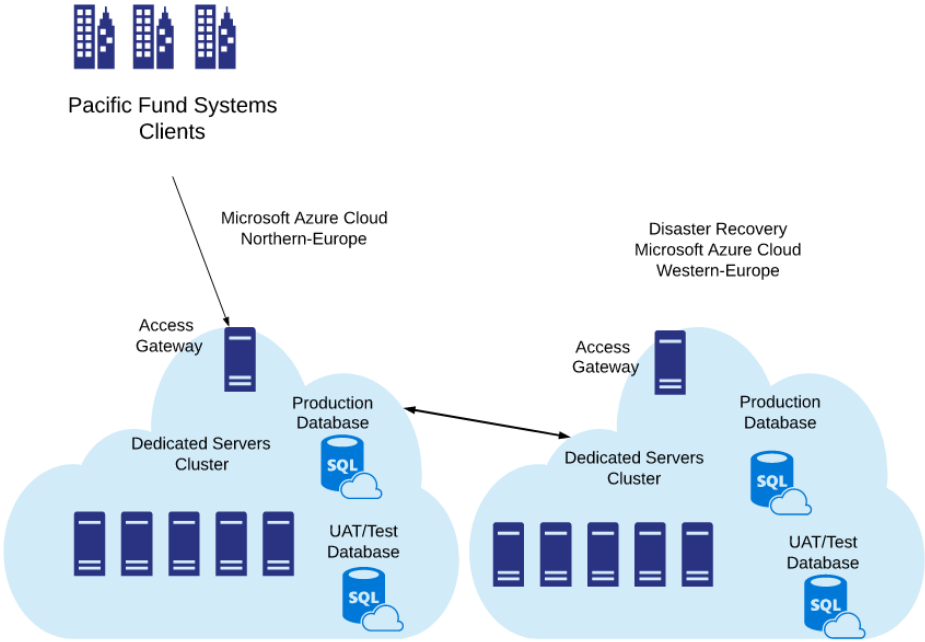
7. Could you describe the PFS-CLOUD Architecture?

The platform consists of a cluster of Virtual Machines that deliver services to external end users as illustrated below:

- Initially located on the Microsoft Azure Cloud platform in Northern Europe region, with real-time failover in Western Europe
- Designed for optimal performance in an isolated network, with secure Citrix XenApp© access
- 24x7 availability incorporates multiple redundant measures to protect operations from power failure, physical intrusion and network outages

Third-party software is used to monitor the performance of the application as well as to provide Disaster Recovery services across regions of the Azure cloud.

PFS-PAXUS, PFS-CONNECT and **PFS-DataFeed** have been enhanced to work better with both Azure and Citrix environments.



8. How secure is PFS-CLOUD?

PFS-CLOUD is protected at multiple levels within the cloud infrastructure. Furthermore, the software is designed in a way to ensure a maximum level of security and protection against external threats.

- Backed up by Microsoft-Azure and Citrix XenApp© **PFS-CLOUD** offers the highest level of security for your data:
 - Direct data centre access is limited to designated operational and technical personnel who have a defined business need to access the physical server infrastructure



Pacific Fund Systems Ltd

Hong Kong United Kingdom
 Australia Isle of Man
 Email information@pacificfundsystems.com

- Redundant power supplies with failover capability to a minimum of two alternative power sources, including power generation capability for off-grid operations
- In addition, physical security controls are designed to “fail closed” during a power disruption to minimise the risk of any unauthorised access during a power outage
- Quarterly penetration tests performed by Trustwave, worldwide leader in Cybersecurity
- Virtual network and firewalls
- Secure remote Multi-Factor Authentication access provided by Citrix XenApp©
- Strong encryption technologies during transfer and for data at rest
- Security real-time monitoring and event logging
- Disaster Recovery
 - A business continuity plan is in place that includes secure data backup and real-time disaster recovery (DR) via a secondary datacentre

9. Can you describe the fault tolerant aspects of PFS-CLOUD?

The Virtual Machines reside on physical servers and as with most physical devices there is a possibility that there could be a failure. In the event that a failure occurs the Azure platform will locate a healthy server upon which to restart the Virtual Machines. This process will complete in a matter of minutes. All disk storage, except for temporary disks, is replicated no less than 3 times in the same Data Centre so disk unavailability is exceptionally unlikely to occur.

10. Can you describe the measures taken for Business continuity?

Beside the fault tolerant aspects of the Azure environment, as described above, we provide failover to a data centre on another region if the entire data centre is affected through the Azure’s Disaster recovery service. In addition the Disaster recovery service we have an additional backup policy.

11. Will you back up our own data and help to restore the data we may have lost or deleted by mistake?

Yes. Contrary to the majority of Software as a Service providers who only backup their systems for internal purposes and not customers data, **we regularly back up all customer data.** We keep these backups daily for one month, monthly for one year and yearly for seven years. In the event that a data restore is required by a client for any reason, the appropriate backup will be used to restore the data on a separate test database environment, enabling customers to retrieve the original data and apply that data back to the live database if required (*at a chargeable fee*).

12. Do you back up the native Azure infrastructure?

Yes. All of the disk images of all the Virtual Machines are backed up. An image backup may be used in the unlikely event that a total restore of the environment is required. Backups are taken daily for two weeks, and then on a monthly basis for two months.



Pacific Fund Systems Ltd

Hong Kong United Kingdom
 Australia Isle of Man
 Email information@pacificfundsystems.com

13. Can I select a particular version of PFS-PAXUS or PFS-CONNECT software with PFS-CLOUD?

The **PFS-CLOUD** service provides the latest version of **PFS-PAXUS** and **PFS-CONNECT** to all customers, with every customers data securely kept separate and private. Nevertheless, tailor-made solutions can be discussed with PFS and provided on request.

14. Can I use a separate environment for testing?

Yes. **PFS-CLOUD** provides two working environments and different databases:

- Live - Production
- UAT - Test

15. Do you offer Trials ?

Yes. We offer free trials for prospective clients.

16. Can I download PFS-PAXUS for the Microsoft Marketplace and use my own Azure subscription/ account to run the PAXUS application?

This option is not available as yet.

17. What devices can connect to PFS-CLOUD?

Microsoft Windows, Apple OSX for **PFS-PAXUS** and **PFS-PAXUS DataFeed**, and any device that can run a compatible browser for **PFS-CONNECT**.

18. Can I use a “dumb terminal”?

No.

19. Do I need to install a client on my PC?

Yes you will need to install Citrix receiver on your device (PC, MAC). The installation is straightforward and can be performed in a few minutes. The installation guide is available from the PFS Support website.

20. How can I contact the PFS-CLOUD Help Desk?

All hosting level connectivity (Citrix) and environment (Azure) enquiries will need to be raised via email to PFSCloudSupport@rfa.com. The **PFS-CLOUD** service is monitored and available 24/7/365.

Queries in relation to **PFS-PAXUS**, **PFS-CONNECT** and **PFS-PAXUS Datafeed** should be submitted via the PFS Support website www.pfssupport.com and will be subject to the normal support terms as outlined in the Maintenance Agreement.



Pacific Fund Systems Ltd

Hong Kong United Kingdom
Australia Isle of Man
Email information@pacificfundsystems.com

21. Do you provide Service Level Agreements (SLAs) for PFS-CLOUD?

Yes. We provide the following Service Availability, Recovery Time Objective and Help Desk Response times as follows:

- PFS-CLOUD Service availability**
 The **PFS-CLOUD** service will be available 24/7 except for any planned maintenance downtime, for which all customers will be duly notified, and temporary outage in the event of a disaster situation during the switch over to the DR server.
- PFS-CLOUD Recovery Time Objective**
 In the event of a disaster that results in the total shutdown of server access, the recovery time objective for restored access shall be no greater than eight (8) hours. However, as we have implemented a real-time disaster recover platform, the switch from the Azure platform to the Disaster Recovery platform will be performed in a matter of minutes.
- PFS-CLOUD Help Desk Response time**
 We aim to respond to all enquiries within thirty (30) minutes. Contractually the formal response times are as follows:

LEVEL	DESCRIPTION	RESPONSE TIME
CRITICAL	An issue which effects the entire SaaS Platform and all Supplier Customers (i.e. servers down, no connectivity)	30 MINUTES
HIGH	A single issue which effects all Users of the Customer	60 MINUTES
MEDIUM	An issue effecting any singular User	8 HOURS

22. How is the service going to evolve in the future?

With regards to the **PFS-PAXUS** application we are planning to introduce a browser-based user interface within the next couple of years that will further lower deployment costs. As the Cloud industry is rapidly evolving, we will continue to constantly consider, evaluate and utilise new opportunities in order to offer the best technology available on the market.



Pacific Fund Systems Ltd

Hong Kong United Kingdom
 Australia Isle of Man
 Email information@pacificfundsystems.com