# HKATS and DCASS Upgrade

# Fallback Plan

# for Exchange and Clearing Participants

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# 1.  Introduction

Hong Kong Exchanges and Clearing Limited ("HKEX") will upgrade both the Hong Kong Futures Automated Trading System ("HKATS") and the Derivatives Clearing and Settlement System ("DCASS") from Genium INET to the HKATS & DCASS Online. The tentative launch date is by the second quarter of 2019.

HKEX has conducted extensive tests on the upgraded systems during the development process.  Furthermore, pilot rehearsal test and market rehearsal will be arranged to ensure system readiness for production rollout.  In addition, HKEX will adopt a prudent approach by developing a set of fallback procedures in order to cater for the unlikely situation where the upgraded applications may encounter irreparable incidents at the initial rollout.  Should the systems not be able to recover even after applying all necessary emergency fixes, HKEX would as a last resort trigger the fallback procedures to revert to the existing HKATS and DCASS Genium INET applications in order to resume trading and clearing services for the derivatives markets.

The fallback procedures would only be applicable in the first two weeks from the launch of the Upgrade platform (the "Stabilization Period").  During this period while HKATS and DCASS Upgrade are in operation, HKEX will continue to maintain HKATS and DCASS Genium INET as the "Standby Fallback Environment".

The detailed fallback procedures and the guidelines for Participants to follow in case of contingency are elaborated in the following sections.  A checklist is prepared as per Appendix A to provide a quick reference for Participants to validate their readiness for the HKATS and DCASS fallback procedures.

The proposed fallback procedures may have impact on the Participants' derivatives trading and clearing operations.  Participants are advised to read this document carefully to ensure that their own fallback procedures are properly put in place and tie in with the HKEX fallback procedures in case they are invoked.

It should be noted that the fallback procedures detailed in this document are subject to further refinement after the completion of various internal testing.  Should there be any amendment to the procedures, Participants will be updated immediately.

## 2. Fallback Procedures

### 2.1 Integrated Fallback Procedures (Trading & Clearing)

Since both HKATS and DCASS will be upgraded to the Upgrade version at the same time, the fallback procedures, when invoked, would cause both HKATS and DCASS to revert to Genium INET.

### 2.2 Maintain Genium INET HKATS and DCASS until the End of the Stabilization Period

The fallback procedures are only applicable during the Stabilization Period, i.e., the first two weeks after the launch of HKATS and DCASS Upgrade. In case it is necessary to declare fallback, HKEX would reinstate the HKATS and DCASS Genium INET environments internally and inform both Exchange and Clearing Participants upon the completion of the switching process. Upon declaration of the fallback, Participants should take note of the following:

To facilitate the fallback, Participants must retain and keep their Genium INET Network Gateways <u>SWITCH ON</u> during the Stabilisation Period. In case of fallback, HKEx would re-establish Genium INET Network Gateways connectivity configurations as per setup on the day before the Upgrade .

(a) For Exchange Participants:

Following the completion of the switching from HKATS Upgraded to HKATS Genium INET, Exchange Participants should verify their connection under Genium INET via HKATS Trading Workstations before resuming their trading operations.

The procedures to invoke HKATS Genium INET Trading Workstation after fallback are the same as those for the previous production environment:

1. Starting the HKATS Client.
2. Select 'Start' → 'All Programs' → 'NASDAQ OMX' → 'GENIUM INET Trading Workstation 1.24.7.229'
3.
A Genium INET Trading Workstation login window will be displayed:
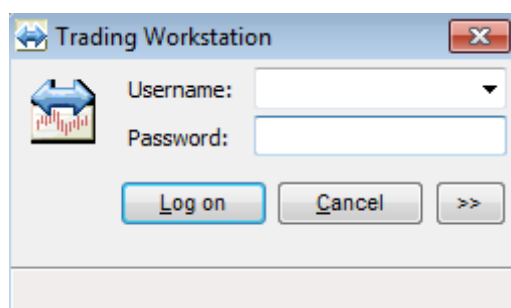
(b) For Clearing Participants:

Following the completion of the switching from DCASS Upgrade to DCASS Genium INET, Clearing Participants should verify their transactions and data under DCASS Genium INET via DCASS Terminals before resuming their clearing operations.

The procedures to invoke DCASS Genium INET DCASS Terminals after fallback are the same as those for the previous production environment:

1. Power ON the DCASS Server
2. After the CW1 Server initialization has completed, start the DCASS Client.
3. Select 'Start' → 'All Programs' → 'NASDAQ OMX' → 'Genium INET Clearing' → 'Clearing Office for 2.0.0805.40662 XXXX'
   where "XXXX" is the DCASS Customer Code of the Clearing Participant

A Genium INET Clearing Workstation login window will be displayed:
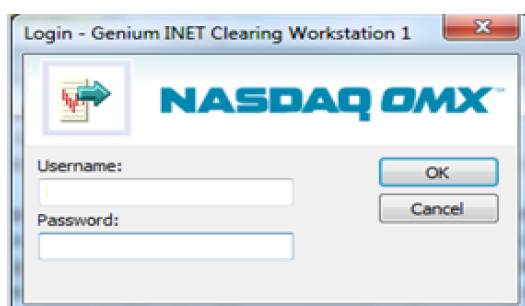


## 2.3 Clearing Data upon Fallback

To ensure that Clearing Participants' portfolios can be recovered in the shortest possible time upon declaration of fallback, HKEX would restore clearing data (e.g., trades, positions and settlement prices) from DCASS Upgrade to DCASS Genium INET upon fallback to DCASS Genium INET. For speedy recover, Clearing Participants are suggested to retrieve their positions and trades for the current day from DCASS Genium INET. Trades for the previous business day could also be retrieved when adjustments to these trades are deemed necessary.

Certain minor changes to the trade details could be found as follows.

| Impacted Area | In Upgrade | Handling when fallback to Genium INET |
|---|---|---|
| Clearing Information (Event ID) | Event ID ≠ Event Orig | Event ID = Event Orig (not applicable to position related record, e.g. fee 6 and position VA) |
| Clearing Information (Delivery state) | Displays as 1 | Empty |
| Clearing Information (Delivery Type) | Displays as Day | Displays as Normal |
| Series/Instrument (Currency) | Empty for Spot and Combo Series | Currency information of Spot and combo series will be shown accordingly |

| Series/Instrument (Instrument Group) | Empty for Combo Series | Instrument Group of combo series will be shown accordingly |
|---|---|---|
| Series/Instrument (Underlying) | Empty for Underlying for Combo Series | Underlying of Combo Series will be shown accordingly |
| Series/Instrument (Stopped) | Displays as FALSE | Issued series: "Stopped"<br>Active series: Empty |
| Series/Instrument (Deliverable) | Empty for combo instruments | Displays as [0] |
| Series/Instrument (Deliverable) | "No" for non-deliverable instruments (e.g. HSI) | Empty for non-deliverable series (e.g. HSI) |
| Series/Instrument (Coupon interest) | Empty | Displays as 0,0000 |
| Series/Instrument (Nominal value) | Empty | Displays as 0 |
| Trade History (Order Number) | Displays as "0000000000000000" | Empty |
| Trade History (T+1) | Displays as "N" | Empty |
| Trade History (Ext status) | Displays as 0 | For trade with deal sources "EMP 1 BR"/ "EMP D BR", the ext status information will be shown accordingly |

## 2.4    Data Recovery Upon Completion of Fallback

Should the fallback procedures be invoked, Participants would be informed promptly.  If derivatives trading on HKATS needs to be temporarily suspended, the trading session would be closed according to the provision.  Any validly executed trades via HKATS in accordance with the HKEX Trading Rules would still be recognised and processed by HKEX. After fallback, HKATS will be brought up with an empty order book. Exchange Participants are required to re-enter any outstanding orders, if needed.  A 20-minute pre-market opening period would be provided for HSI futures, HHI futures and MHI futures to ensure the markets are opened orderly in case of same day trading resumption.

The recovery of clearing data would depend on the time when the system fallback occurs.  The impact to the Participants would be different.  HKEX would announce the actual scenario to the Participants in case fallback is triggered.  Briefly described below are the fallback arrangements under three different scenarios:

### (1) If the system fails and falls back to Genium INET before market opens

No trades and post-trade transactions would have been entered.  Depending on the declaration time of the fallback, trading may or may not be delayed.  After fallback, all relevant clearing data would be restored in DCASS Genium INET. Clearing Participants are required to verify the positions as at THE PREVIOUS DAY after fallback.

### (2) If the system fails during the day

*Should fallback be declared*, trades executed on Upgraded HKATS on the Failure Day would be converted and reloaded by HKEX to DCASS Genium INET. However, Participants should note that:

Upon resumption of DCASS Genium INET, Clearing Participants should verify the accuracy of the converted data via Genium INET DCASS Terminals. Clearing Participants could then continue with their post-trade transactions based on their operational needs. A time window of up to two hours would be available for Clearing Participants to input their post-trade transactions. Upon the completion of post-trade transactions input, HKEX would conduct day end processing on DCASS Genium INET for the Failure Day. DCASS Genium INET would then be ready for the next business day (i.e., Failure Day + 1) thereafter.

# 3    OMnet Application Programming Interface ("OAPI")

### (a) For Exchange Participants:

Exchange Participants are required to modify its OMnet Application Programming Interface ("OAPI") to cater for the HKATS Upgrade. Exchange Participants are advised to maintain the OAPI program for HKATS Genium INET so as to reinstate their operations in case of fallback from HKATS Upgrade to HKATS Genium INET. Alternatively, Exchange Participants may want to resort to terminal input in case of fallback.

### (b) For Clearing Participants:

Subject to its operational model, a Clearing Participant may need to upgrade its OAPI to cater for the DCASS Upgrade. Upon fallback from DCASS Upgrade to DCASS Genium INET, whether a Clearing Participant should fallback its Upgraded DCASS to the DCASS Genium INET is again subject to its operational model.

Should Clearing Participants need to upgrade its DCASS Online application to cater for the Upgrade, Clearing Participants should maintain both the Upgrade and Genium INET versions during the DCASS Stabilisation Period to cater for possible fallback.

At the close of the business day immediately before the launch of Upgrade, each Clearing Participants should back up all critical business data in their BOS in Genium INET version and safe keep the backup image.

In case of fallback, Participants should restore the backup image (including both system applications and data) to their BOS. If their BOS relies on OAPI programs but their OAPI fallback programs are not in place, participants should consider temporarily using DCASS Terminals as an alternative to OAPI programs.

Participants should arrange technical support from their internal IT support or relevant BOS vendor to handle the BOS fallback procedures.

Once the BOS fallback procedures are completed, Participants should verify the accuracy of the data after fallback to ensure their BOS would be ready for production use.

# 4 Summary of Actions Required from Participants

The following is a summary of actions required from Participants to cater for the execution of the fallback procedures:

## (a) For Exchange Participants:

- Exchange Participants need to prepare internal fallback procedures before the upgrade of HKATS Upgrade.
- Maintain version HKATS Genium INET OAPI Program and HKATS Genium INET Trading Workstation Terminals and Network Gateways during the Stabilisation Period, if applicable.
- Do not change the password during the Stabilization Period, unless very much necessary.
- Use Genium INET HKATS Trading Workstation in case of fallback during the Stabilization Period.
- Provide HKEX with emergency contact of responsible trading staff of the Exchange Participants during Stabilization Period for fallback purpose.
- Verify whether the Order book is empty with no outstanding order after logging in by Genium INET HKATS Trading Workstation or OAPI query after fallback.
- Verify whether the trades shown in the Clearing Trades Window are correct.
- Ignore the traded information (e.g. Open, High, Low, Turnover) on Combination Series as it could be combined with figures established in the previous T+1 Session before fallback.
- All HKATS system settings including but not limited to user accounts, passwords of OAPI and Market Data connectivity settings shall be restored to the corresponding settings as at day end of the last business day before the upgrade.
- All PTRM settings including but not limited to risk group and risk limit settings shall be restored by HKEX to the corresponding settings as at day end of the last business day before the upgrade.

## (b) For Clearing Participants:

- Develop OAPI fallback procedures and data update procedures, if applicable.
- Maintain version Genium INET DCASS Servers & Terminals during the Stabilisation Period.
- Clearing staff of Clearing Participants to stand by for possible input of post-trade transactions upon fallback, if applicable. The clearing staff should be ready to come back to their offices outside office hours, and in the worst case, during mid-night hours.
- Provide HKEX with emergency contact (including mobile phone number(s) and email address(es)) of responsible clearing staff of the Clearing Participants during Stabilization Period for fallback purpose.
- Use Genium INET DCASS Servers and Terminals in case of fallback during the Stabilization Period. To enable Genium INET DCASS Servers, please refers to Appendix B.
- Verify the accuracy of converted data via version Genium INET DCASS Terminals after fallback.

# 5  Impact on Derivatives Trading and Clearing Services

- In the event of a system failure which requires the execution of the fallback procedures, HKEX might suspend derivatives trading and clearing services.

- Once fallback is declared, the fallback procedures (including system/data conversion to Genium INET and verification) are estimated to take about three hours to complete before the resumption of HKATS & DCASS Genium INET. Subject to the triggering time of the fallback procedures, the trading and clearing services may be suspended for one day.

- HKEX would inform Participants immediately once the decision for fallback has been made. Participants would also be informed of the fallback schedule, time of service resumption, impact to Participants and relevant information upon fallback.

- Should the fallback procedures be triggered in the morning, both HKATS Genium INET and DCASS Genium INET may be ready in the afternoon of the failure day for the resumption of trading and clearing services.

# 6  Participant Communications

Participants would normally be informed of any contingency arrangements via Clearing Message through DCASS Online and/or Market Message through HKATS Online.

In case of contingency where Participants could not access either DCASS and/or HKATS, HKEX would communicate with Participants via email.

In case of fallback, relevant information would also be issued via press release.

Please note that the DCASS Hotline at 2979 7222 and/or HKATS Hotline at 2211 6360 would continue to be available during contingency and fallback.

# 7  Enquiries

For any enquiries about the fallback procedures, Participants can contact the following hotlines during office hours:

Exchange Participants:     2211 6360
Clearing Participants:      2979 7222

## **Appendix A**

### **Participant Checklist - Upgrade of HKATS and DCASS**

| **Items to be checked** | √ |
|---|---|
| **(A)    *Before launch of HKATS and DCASS Upgrade version*** | |
| 1    Have you read and understood this document ("HKATS and DCASS Upgrade Fallback Plan for Exchange and Clearing Participants")? | |
| 2    Have you passed this document to your internal IT support or system vendor and ensured that they would make necessary follow-up action? | |
| 3    Have you ensured that there is always one person in your company who has email contact with HKEX and also with their HKATS Trading Workstations switched on to obtain announcement regarding the fallback arrangement? | |
| 4    *For Clearing Participants only:* If you would perform recovery for your Back Office System ("BOS") and OMnet Application Programming Interface ("OAPI") upon fallback, have you developed a set of detailed fallback procedures and tested such procedures? | |
| 5    *For Clearing Participants only:* Have you arranged to keep proper records of clearing trades in case of fallback during the Stabilisation Period? | |
| **(B)    *At the close of business just before launch of HKATS and DCASS Upgrade*** | |
| 6    Have you made backup of all critical business data in your internal system, e.g. OAPI program and BOS? | |
| 7    *For Clearing Participants only:*  Have you printed and/or downloaded all reports from version Genium INET DCASS Terminals before the launch of DCASS Upgrade? | |
| **(C)    *During the Stabilisation Period*** | |
| 8    Have you retained and kept your Genium INET Network Gateways **SWITCH ON**? | |
| 9    Do not change any password during the stabilisation period. | |
| 10    *For Clearing Participants only:* Have you ensured that proper records of clearing trades in case of fallback? | |

| Items to be checked | √ |
|---|---|
| **(D)**      **When HKEX announces Fallback** | |
| 11    Have you successfully signed on to designated email accounts to view the fallback announcements made by HKEX? | |
| 12    *For Exchange Participants only:* Have you turned on your HKATS Workstations to view fallback announcements? | |
| 13    *For Exchange and Clearing Participants:* Would you fallback your OAPI as described in Section 3 of this document? | |
| 14    *For Clearing Participants only:* Have you informed your internal IT support or system vendor about fallback and requested them to execute BOS and OAPI fallback? | |
| 15    *For Clearing Participants only:* Have you verified the accuracy of the restored data in your BOS? | |
| 16    *For Clearing Participants only:* Have you enabled the Windows Services of DCASS Servers according to Appendix B? | |
| **(E)**      **When Clearing Services resumes** | |
| 16    Have you verified the clearing reports from DCASS Genium INET against the data in your BOS? | |

## Appendix B - Procedures to enable the Windows Services of DCASS Servers

1. To open Windows Services,
   - click on your Start button to open the Windows Menu. Select Run. This opens the Run box. Type services.msc in it and hit Enter to open the Services Manager.
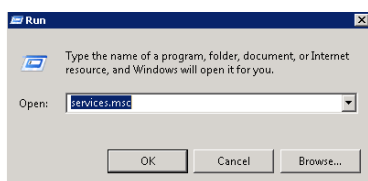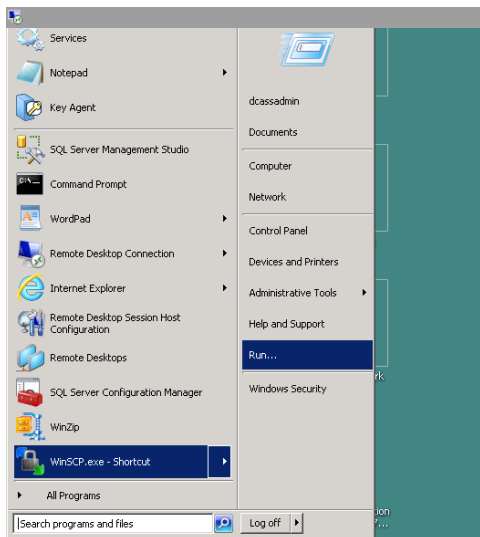
2.    To enable the Windows Service of DCASS Server,

- highlight the Service "CW1 Server 1" under the Name column.  Double-click on the Service "CW1 Server 1" to open its Properties box. In the Properties box, select Manual in the Startup type drop-down menu, then press Apply button and OK button
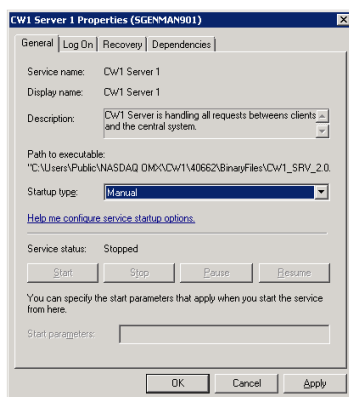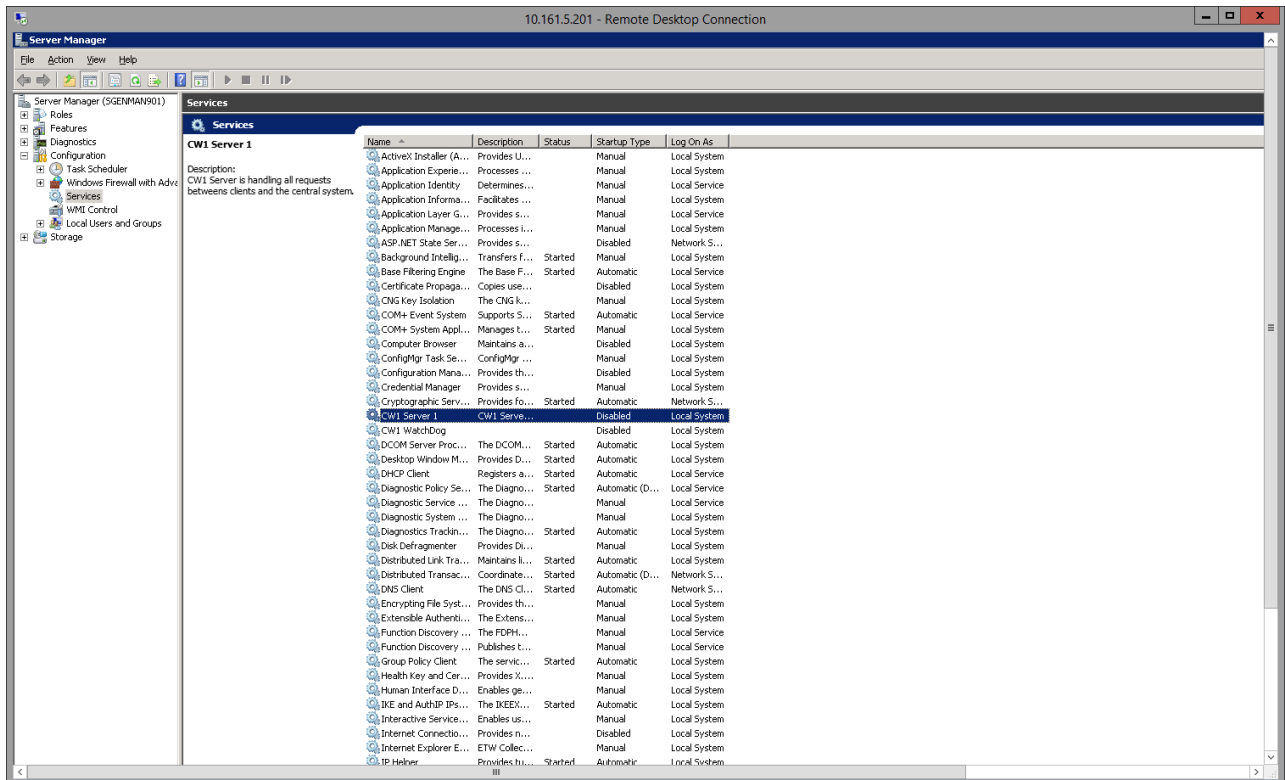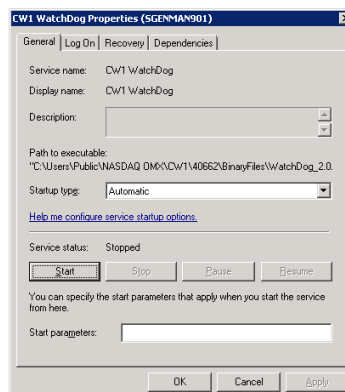




3.    To enable the Windows Service of DCASS Server WatchDog,

- highlight the Service "CW1 WatchDog" under the Name column.  Double-click on the Service "CW1 WatchDog" to open its Properties box. In the Properties box, select Automatic in the Startup type drop-down menu, then press Apply button,
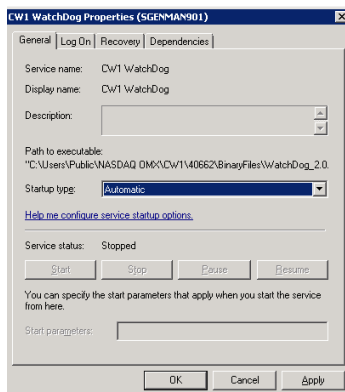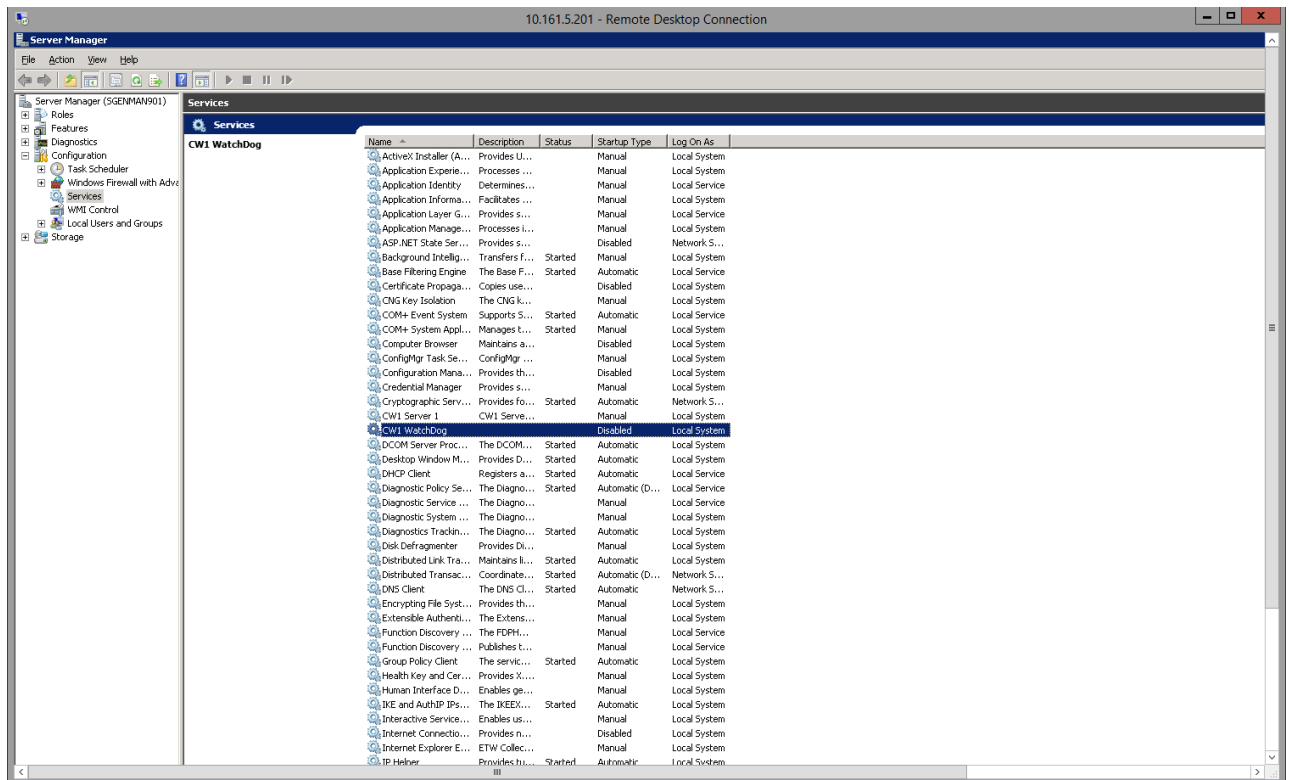
and press Start button in the Service status.  Press OK button.

4.  Ensure that both Windows Service of *CW1 Server 1* is **Manual** and **Started,** and *CW1 WatchDog* is **Automatic** and **Started**.