

2026년 지방기능경기대회 채점기준표

| | | | | | |
|-------|-----------|-----|--------------------|-------------|--------|
| 직 종 명 | IT네트워크시스템 | 과제명 | Linux Environments | 과제번호 | 제 1 과제 |
| 경기시간 | 4시간 | 비번호 | | 심사위원 확 인 | (인) |

1. 배점 항목

| 번호 | 제목 | 배점 번호 | 내용 | 배점 |
|----|----------|----------|---------------------|------|
| 1 | LDAP | 1 | LDAP 엔트리 조회 | 1.50 |
| | 인증 기관 | 2 | 인증 기관 및 인증서 검증 | 1.50 |
| | 파일 공유 | 3 | Samba public 공유 | 1.50 |
| | | 4 | Samba internal 공유 | 1.50 |
| | DNS | 5 | Internal 도메인 서비스 | 1.50 |
| | | 6 | DMZ 도메인 서비스 | 1.50 |
| | 원격 관리 | 7 | 인증서 인증 기반 SSH 원격 접속 | 1.50 |
| | 웹 | 8 | 웹 서비스 동작 검증 | 1.50 |
| | 리버스 프록시 | 9 | 리버스 프록시 동작 검증 | 1.50 |
| | 메일 | 10 | 메일 서비스 검증 | 1.50 |
| | | 11 | LDAP 백엔드 검증 | 1.50 |
| | 백업 | 12 | 백업 서비스 검증 | 1.50 |
| 2 | VPN | 13 | VPN 검증 및 내부 리소스 접근 | 1.50 |
| | 클라이언트 검증 | 14 | 웹 서비스 테스트 | 1.50 |
| | | 15 | 메일 서비스 테스트 | 1.50 |
| | 투명 프록시 | 16 | 투명 프록시 동작 검증 | 1.50 |
| 3 | 방화벽 | 17 | 네트워크 서비스 검증 | 1.50 |
| | | 18 | 보안 서비스 검증 | 1.50 |
| | 고가용성 | 19 | 웹 서비스 고가용성 | 1.50 |
| | | 20 | 프록시 서비스 고가용성 | 1.50 |
| | 자동화 | 21 | 웹 서비스 제거 자동화 | 1.50 |
| | | 22 | 웹 서비스 배포 자동화 | 1.50 |
| | 추가과제 | 23 | Rsyslog 포트 연결 확인 | 0.20 |
| | | 24 | Rsyslog 테스트 | 0.20 |
| | | 25 | 로그 관리 확인 | 0.20 |
| | | 26 | 외부 침입 감지 테스트 | 0.20 |
| | | 27 | NTP 키 인증 구성 테스트 | 0.20 |
| | | 28 | NTP 접근 제어 테스트 | 0.20 |
| | | 29 | NTP 고가용성 | 0.20 |
| | | 30 | Stunnel 포트 확인 | 0.20 |
| | | 31 | Stunnel 인증 확인 | 0.10 |
| | | 32 | NFS 마운트 확인 | 0.10 |
| | | 33 | RAID 구성 확인 | 0.10 |
| | | 34 | RAID 마운트 확인 | 0.10 |
| 합계 | | | | 35 |

| 채점 번호 | 채점 내용 |
|----------|--|
| 주의 사항 | <p>별도 명시가 없는 경우 root 또는 기본 사용자 계정으로 로그인하여 채점을 수행합니다.</p> <p>선수 요구 사항에 따라 캐시 값을 적절히 삭제 후 채점을 다시 진행할 수 있습니다.</p> <p>채점 시 적색 표시가 있는 경우 해당 부분만 채점하며 출력값과 채점 내용이 일치하는지 확인합니다.</p> <p>채점 명령 수행 후 ICMP, DNS 등 일부 테스트에서 timeout이 발생할 수 있습니다. 이 경우에 동일 명령을 다시 수행하여 재채점 할 수 있습니다.</p> <p>채점 시 명령어 수행을 위한 패키지 설치가 필요할 경우 설치를 진행합니다.</p> <p>출력 값의 순서는 다를 수 있으며 함께 출력되는 난수 값은 무시합니다.</p> |
| 1 | <pre>int-srv ldapsearch -H ldap://localhost -b dc=int,dc=worldskills,dc=org -x "(&(objectclass=organizationalunit)(ou=Employees))" -D cn=admin,dc=int,dc=worldskills,dc=org -w Skill39** grep dn dn: ou=Employees,dc=int,dc=worldskills,dc=org ldapsearch -H ldap://localhost -b ou=Employees,dc=int,dc=worldskills,dc=org -x objectclass=person -D cn=admin,dc=int,dc=worldskills,dc=org -w Skill39** egrep "dn Number mail" dn: uid=ws-user01,ou=Employees,dc=int,dc=worldskills,dc=org mail: ws-user01@worldskills.org uidNumber: 2001 gidNumber: 2001 dn: uid=ws-user02,ou=Employees,dc=int,dc=worldskills,dc=org mail: ws-user02@worldskills.org uidNumber: 2002 gidNumber: 2002</pre> |
| 2 | <pre>int-srv openssl x509 -in /etc/ssl/ws-RootCA/cacert.pem -noout -text egrep "Subject: CA:TRUE" Subject: C = KR, CN = worldskills-RootCA CA:TRUE openssl x509 -in /etc/ssl/ws-SubCA/cacert.pem -noout -text egrep "Subject: CA:TRUE" Subject: C = KR, CN = worldskills-SubCA CA:TRUE openssl verify -CAfile /etc/ssl/ws-RootCA/cacert.pem /etc/ssl/ws-SubCA/cacert.pem /etc/ssl/ws-SubCA/cacert.pem: OK for cert in /etc/ssl/ws-SubCA/newcerts/*; do openssl x509 -in "\$cert" -noout -issuer -subject awk '/^issuer=/ {show = /CN = worldskills-SubCA/} /^subject=/ && show'; done subject=C = KR, CN = www.worldskills.org subject=C = KR, CN = mail.worldskills.org cat /etc/ssl/ws-SubCA/cacert.pem /etc/ssl/ws-RootCA/cacert.pem > /tmp/fullchain.crt; for cert in /etc/ssl/ws-SubCA/newcerts/*; do openssl verify -CAfile /tmp/fullchain.crt \$cert; done /etc/ssl/ws-SubCA/newcerts/01.pem: OK /etc/ssl/ws-SubCA/newcerts/02.pem: OK fpsshca=\$(ssh-keygen -lf /etc/ssh/ssh-CA/ca awk '{print \$2}'); fpsshcert=\$(ssh-keygen -L -f /root/.ssh/id_ecdsa-cert.pub grep "Signing CA:" awk '{print \$4}'); if [["\$fpsshca" = "\$fpsshcert"]]; then echo "ok"; fi ok ssh-keygen -L -f /root/.ssh/id_ecdsa-cert.pub grep "Type:" Type: ecdsa-sha2-nistp256-cert-v01@openssh.com user certificate</pre> |
| 3 | <pre>int-srv smbclient //localhost/public -I 127.0.0.1 -U "%" -c ls grep "blocks available" wc -l 1</pre> |

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|---|--|
| | <pre>touch /tmp/test; smbclient //localhost/public -l 127.0.0.1 -U "ws-user%Skill39**" -c "put /tmp/test test" putting file /tmp/test as Wtest (0.0 kb/s) (average -nan kb/s) touch /tmp/test; smbclient //localhost/public -l 127.0.0.1 -U "%" -c "put /tmp/test test" NT_STATUS_ACCESS_DENIED opening remote file Wtest</pre> |
| 4 | <pre>int-srv smbclient //localhost/internal -l 127.0.0.1 -U "%" -c "ls" tree connect failed: NT_STATUS_ACCESS_DENIED touch /tmp/test; smbclient //localhost/internal -l 127.0.0.1 -U "ws-user%Skill39**" -c "put /tmp/test test" putting file /tmp/test as Wtest (0.0 kb/s) (average -nan kb/s)</pre> |
| 5 | <pre>int-srv dig +short +time=2 +tries=1 @10.1.10.10 int-srv.int.worldskills.org A 10.1.10.10 dig +short +time=2 +tries=1 @10.1.10.10 -x 10.1.10.10 int-srv.int.worldskills.org. dig +short +time=2 +tries=1 @2001:db8:1001:10::10 int-srv.int.worldskills.org AAAA 2001:db8:1001:10::10 dig +short +time=2 +tries=1 @2001:db8:1001:10::10 -x 2001:db8:1001:10::10 int-srv.int.worldskills.org. dig +recurse +time=2 +tries=1 @127.0.0.1 int.worldskills.org SOA grep NOERROR ;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 64244 for zone in worldskills.org 20.1.10.in-addr.arpa. 0.2.0.0.1.0.0.1.8.b.d.0.1.0.0.2.ip6.arpa.; do rndc zonestatus \$zone grep secondary; done wc -l 3 for zone in worldskills.org 20.1.10.in-addr.arpa. 0.2.0.0.1.0.0.1.8.b.d.0.1.0.0.2.ip6.arpa.; do dig +short +time=2 +tries=1 @127.0.0.1 \$zone SOA awk '{print \$1}' grep ns.worldskills.org; done wc -l 3</pre> |
| 6 | <pre>prx01 for record in mail.worldskills.org ns.worldskills.org www.worldskills.org prx.worldskills.org prx01.worldskills.org prx02.worldskills.org web01.worldskills.org web02.worldskills.org; do dig +short +time=2 +tries=1 @10.1.20.20 \$record A; done 10.1.20.10 10.1.20.20 10.1.20.20 10.1.20.20 10.1.20.21 10.1.20.22 10.1.20.31 10.1.20.32 for record in 10.1.20.10 10.1.20.21 10.1.20.22 10.1.20.31 10.1.20.32; do dig +short +time=2 +tries=1 @10.1.20.20 -x \$record; done mail.worldskills.org. prx01.worldskills.org. prx02.worldskills.org. web01.worldskills.org. web02.worldskills.org. for record in mail.worldskills.org ns.worldskills.org www.worldskills.org prx.worldskills.org prx01.worldskills.org prx02.worldskills.org web01.worldskills.org web02.worldskills.org; do dig +short +time=2 +tries=1 @2001:db8:1001:20::20 \$record AAAA; done 2001:db8:1001:20::10 2001:db8:1001:20::20 2001:db8:1001:20::20 2001:db8:1001:20::20 2001:db8:1001:20::21 2001:db8:1001:20::22 2001:db8:1001:20::31 2001:db8:1001:20::32</pre> |

| | |
|---|---|
| | <pre> for record in 2001:db8:1001:20::10 2001:db8:1001:20::21 2001:db8:1001:20::22 2001:db8:1001:20::31 2001:db8:1001:20::32; do dig +short +time=2 +tries=1 @2001:db8:1001:20::20 -x \$record; done mail.worldskills.org. prx01.worldskills.org. prx02.worldskills.org. web01.worldskills.org. web02.worldskills.org. dig +short +time=2 +tries=1 @127.0.0.1 worldskills.org MX 10 mail.worldskills.org. dig +recurse +time=2 +tries=1 @127.0.0.1 worldskills.org SOA grep "recursion" ;; WARNING: recursion requested but not available prx02 for zone in worldskills.org 20.1.10.in-addr.arpa. 0.2.0.0.1.0.0.1.8.b.d.0.1.0.0.2.ip6.arpa.; do rndc zonestatus \$zone grep secondary; done wc -l 3 dig +recurse +time=2 +tries=1 @127.0.0.1 worldskills.org SOA grep "recursion" ;; WARNING: recursion requested but not available </pre> |
| 7 | <pre> mail journalctl -f -u ssh grep Accepted web01 journalctl -f -u ssh grep Accepted web02 journalctl -f -u ssh grep Accepted int-srv for host in 10.1.20.10 10.1.20.31 10.1.20.32; do ssh root@\$host true; done 별도의 오류가 발생하지 않는지 확인 후 각 디바이스의 SSH 접속 로그 확인 mail Mar 29 20:22:26 mail.worldskills.org sshd[21423]: Accepted publickey for root from 10.1.10.10 port 37388 ssh2: ECDSA-CERT SHA256:3JtibwoNdpSLv+KrA95kt4Jmo95X4u7NNUvxLLAp5BU ID root access key (serial 0) CA ECDSA SHA256:bQpPTdkNbqWdK12Bvy7ItKB00VQjStT7uUZIm0B04Aw web01 Mar 29 20:21:23 web01.worldskills.org sshd[11766]: Accepted publickey for root from 10.1.10.10 port 36110 ssh2: ECDSA-CERT SHA256:3JtibwoNdpSLv+KrA95kt4Jmo95X4u7NNUvxLLAp5BU ID root access key (serial 0) CA ECDSA SHA256:bQpPTdkNbqWdK12Bvy7ItKB00VQjStT7uUZIm0B04Aw web02 Mar 29 20:21:23 web02.worldskills.org sshd[11658]: Accepted publickey for root from 10.1.10.10 port 60074 ssh2: ECDSA-CERT SHA256:3JtibwoNdpSLv+KrA95kt4Jmo95X4u7NNUvxLLAp5BU ID root access key (serial 0) CA ECDSA SHA256:bQpPTdkNbqWdK12Bvy7ItKB00VQjStT7uUZIm0B04Aw </pre> |
| 8 | <pre> web01 curl -s --connect-timeout 2 http://127.0.0.1/ 2>&1 worldskills web service curl -s --connect-timeout 2 http://127.0.0.1/whoami 2>&1 web01 curl -s --connect-timeout 2 http://127.0.0.1/test 2>&1 Contents Unavailable web02 curl -s --connect-timeout 2 http://127.0.0.1/ 2>&1 worldskills web service curl -s --connect-timeout 2 http://127.0.0.1/whoami 2>&1 web02 curl -s --connect-timeout 2 http://127.0.0.1/test 2>&1 Contents Unavailable </pre> |

client

채점 전 선수의 요구 사항에 따라 VPN 인터페이스를 활성화할 수 있습니다.



```
echo | openssl s_client -connect www.worldskills.org:443 2>&1 | grep "Verification: OK"
Verification: OK
```

```
curl https://www.worldskills.org -v 2>&1 | egrep "subjectAltName|verify ok"
* subjectAltName: host "www.worldskills.org" matched cert's "www.worldskills.org"
* SSL certificate verify ok.
```

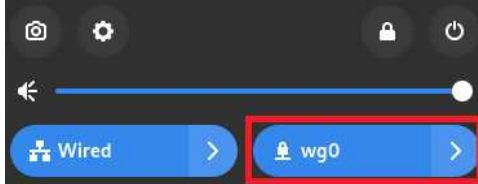
```
curl https://www.worldskills.org
worldskills web service
```

```
curl -Lv http://www.worldskills.org 2>&1 | grep redirect
* Clear auth, redirects to port from 80 to 443
```

```
curl -I https://www.worldskills.org 2>&1 | grep via-proxy
via-proxy: prx01
```

client

채점 전 선수의 요구 사항에 따라 VPN 인터페이스를 활성화할 수 있습니다.




mail

```
ss -tulpn | awk '{print $5}' | egrep ":[25]:465:587:143:993" | sort
0.0.0.0:143
0.0.0.0:25
0.0.0.0:465
0.0.0.0:587
0.0.0.0:993
[::]:143
[::]:25
[::]:465
[::]:587
[::]:993
```

client

```
echo -e "ehlo mail.worldskills.orgWnAUTH PLAIN AHdzLXVzZXIwMQBTa2lsbDM5Kio=WnMAIL
FROM:<ws-user01@worldskills.org>WnRCPT TO:<ws-user02@worldskills.org>WnDATAWnFrom:
ws-user01@worldskills.orgWnTo: ws-user02@worldskills.orgWnSubject: TestWn.WnQUIT" |
openssl s_client -starttls smtp -connect mail.worldskills.org:587 -ign_eof
250-mail.worldskills.org
250-PIPELINING
250-SIZE 10240000
250-VRFY
250-ETRN
250-AUTH PLAIN LOGIN
250-ENHANCEDSTATUSCODES
250-8BITMIME
250-DSN
250-SMTPUTF8
250 CHUNKING
235 2.7.0 Authentication successful
250 2.1.0 Ok
250 2.1.5 Ok
354 End data with <CR><LF>.<CR><LF>
250 2.0.0 Ok: queued as AD02E60275
```

| | |
|----|--|
| | <pre>echo -e "a login ws-user02 Skill39**Wna LIST W\"W\" W\"*W\"Wna logout" openssl s_client -connect mail.worldskills.org:993 -ign_eof a OK [CAPABILITY IMAP4rev1 SASL-IR LOGIN-REFERRALS ID ENABLE IDLE SORT SORT=DISPLAY THREAD=REFERENCES THREAD=REFS THREAD=ORDEREDSUBJECT MULTIAPPEND URL-PARTIAL CATENATE UNSELECT CHILDREN NAMESPACE UIDPLUS LIST-EXTENDED I18NLEVEL=1 CONDSTORE QRESYNC ESEARCH ESORT SEARCHRES WITHIN CONTEXT=SEARCH LIST-STATUS BINARY MOVE SNIPPET=FUZZY PREVIEW=FUZZY PREVIEW STATUS=SIZE SAVEDATE LITERAL+ NOTIFY SPECIAL-USE] Logged in * LIST (WHasNoChildren WUnMarked WSent) "." Sent * LIST (WHasNoChildren WTrash) "." Trash * LIST (WHasNoChildren) "." INBOX a OK List completed (0.001 + 0.000 + 0.001 secs). * BYE Logging out a OK Logout completed (0.001 + 0.000 secs). closed</pre> |
| 11 | <pre>int-srv systemctl stop slapd mail doveadm user ws-user01@worldskills.org doveadm(ws-user01@worldskills.org)<23561><>: Error: auth-master: userdb lookup(ws-user01@worldskills.org): Auth USER lookup failed field value int-srv systemctl start slapd mail doveadm user ws-user01@worldskills.org field value user ws-user01 uid 2000 gid 2000 home /var/mail/ws-user01 mail maildir:/var/mail/ws-user01</pre> <p>채점 후 slapd 서비스가 stop 상태라면 systemctl start slapd 명령을 수행합니다.</p> |
| 12 | <pre>mail 아래 명령으로 스크립트를 실행 후 오류가 발생하지 않는지 확인합니다. /opt/backup.sh 아래 명령 수행 후 아무런 값도 출력되지 않아야 합니다. diff -r /var/mail /backup/mailbox diff -r /etc/postfix /backup/postfix diff -r /etc/dovecot /backup/dovecot mail 시간 관계없이 스크립트가 약 1분 간격으로 실행되고 있는지 확인 journalctl -f -u cron.service Mar 29 22:37:01 mail.worldskills.org CRON[23596]: pam_unix(cron:session): session opened for user root(uid=0) by (uid=0) Mar 29 22:37:01 mail.worldskills.org CRON[23597]: (root) CMD (/opt/backup.sh) Mar 29 22:37:01 mail.worldskills.org CRON[23596]: pam_unix(cron:session): session closed for user root Mar 29 22:38:01 mail.worldskills.org CRON[23619]: pam_unix(cron:session): session opened for user root(uid=0) by (uid=0) Mar 29 22:38:01 mail.worldskills.org CRON[23620]: (root) CMD (/opt/backup.sh) Mar 29 22:38:01 mail.worldskills.org CRON[23619]: pam_unix(cron:session): session closed for user root</pre> |
| 13 | <pre>client 채점 전 VPN 인터페이스를 비활성화합니다.</pre>  <pre>ping 10.1.10.10 -c 4</pre> |

PING 10.1.10.10 (10.1.10.10) 56(84) bytes of data.

--- 10.1.10.10 ping statistics ---

4 packets transmitted, 0 received, 100% packet loss, time 3056ms

dig +recurse +time=2 +tries=1 int-srv.int.worldskills.org SOA | grep status

:: ->>HEADER<<- opcode: QUERY, status: NXDOMAIN, id: 61873

client

VPN 인터페이스를 활성화합니다.



ping 10.1.10.10 -c 4

PING 10.1.10.10 (10.1.10.10) 56(84) bytes of data.

64 bytes from 10.1.10.10: icmp_seq=1 ttl=63 time=2.64 ms

64 bytes from 10.1.10.10: icmp_seq=2 ttl=63 time=7.90 ms

64 bytes from 10.1.10.10: icmp_seq=3 ttl=63 time=6.09 ms

64 bytes from 10.1.10.10: icmp_seq=4 ttl=63 time=1.72 ms

--- 10.1.10.10 ping statistics ---

4 packets transmitted, 4 received, 0% packet loss, time 3006ms

rtt min/avg/max/mdev = 1.722/4.590/7.900/2.511 ms

dig +recurse +time=2 +tries=1 int-srv.int.worldskills.org SOA | grep status

:: ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 42741

client

채점 전 VPN 인터페이스를 비활성화합니다.



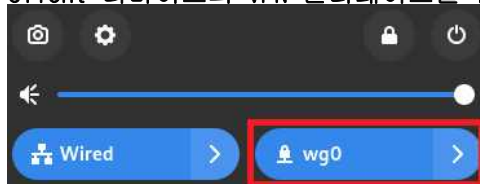
firefox 웹 브라우저를 실행합니다.



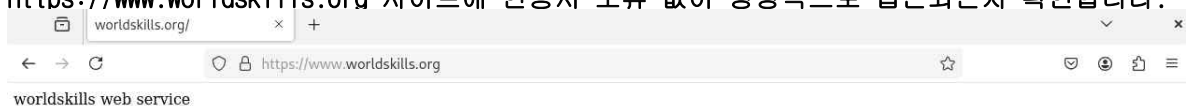
https://www.worldskills.org 사이트에 인증서 오류 없이 정상적으로 접근되는지 확인합니다.



client 디바이상의 VPN 인터페이스를 활성화합니다.

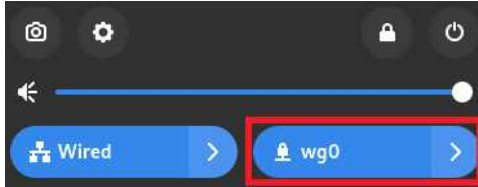


https://www.worldskills.org 사이트에 인증서 오류 없이 정상적으로 접근되는지 확인합니다.



client

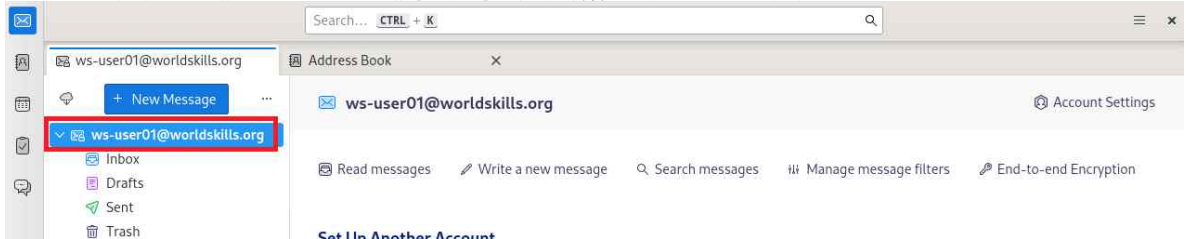
VPN 인터페이스를 활성화합니다.



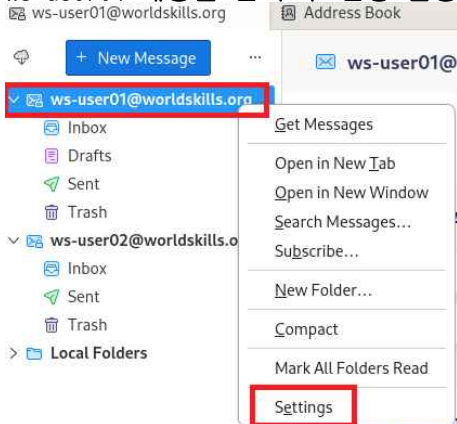
thunderbird 메일 클라이언트를 실행합니다.



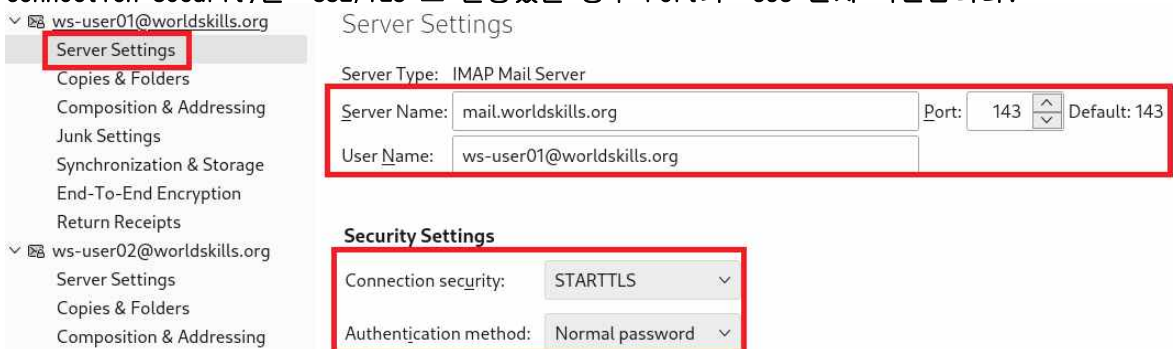
메일 클라이언트에 ws-user01 계정이 등록되어있는지 확인합니다.



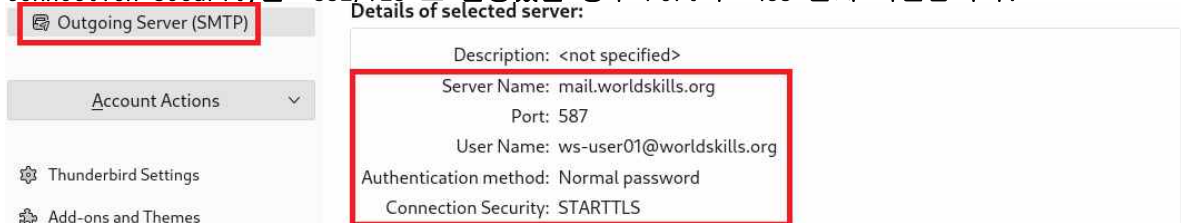
ws-user01 계정을 선택 후 환경 설정을 확인합니다.

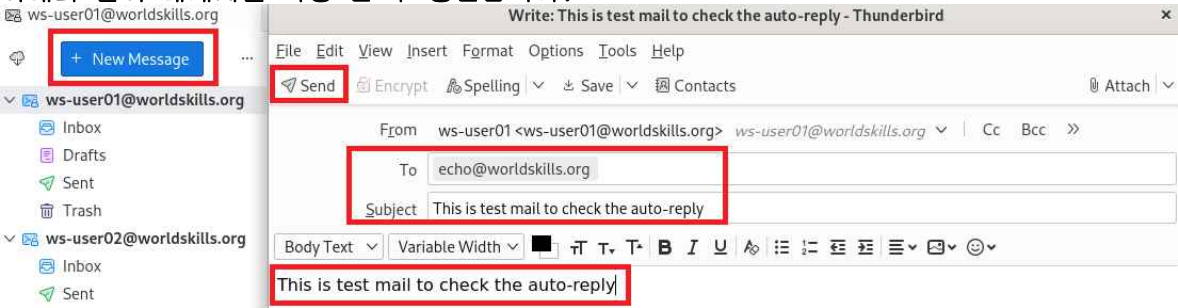
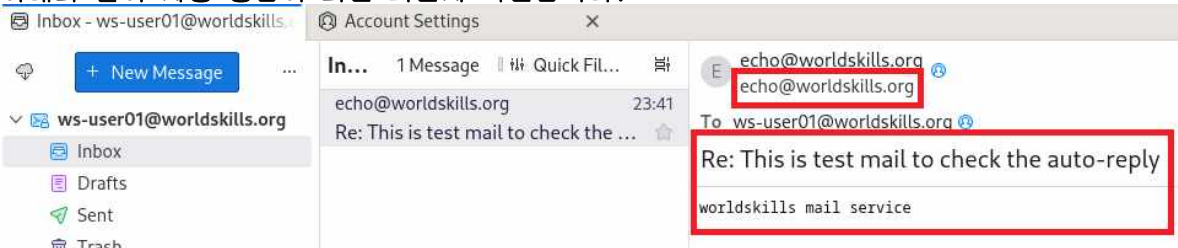
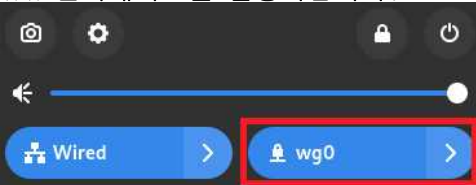



Connection Security를 "SSL/TLS"로 설정했을 경우 Port가 "993"인지 확인합니다.



Connection Security를 "SSL/TLS"로 설정했을 경우 Port가 "465"인지 확인합니다.



| | |
|----|--|
| | <p>아래와 같이 메세지를 작성 한 후 송신합니다.</p>  <p>아래와 같이 자동 응답이 회신 되는지 확인합니다.</p>  |
| 16 | <p>client VPN 인터페이스를 활성화합니다.</p>  <pre>curl -I http://www.worldskills.org 2>&1 grep x-secured-by x-secured-by: worldskills-prx</pre> <p>int-srv <pre>curl -I http://www.worldskills.org 2>&1 grep x-secured-by x-secured-by: worldskills-prx</pre></p> |
| 17 | <p>client <pre>tcpdump -n icmp[icmptype] = icmp-echo</pre></p> <p>int-srv <pre>ping 1.1.1.20 -c 4 PING 1.1.1.20 (1.1.1.20) 56(84) bytes of data. 64 bytes from 1.1.1.20: icmp_seq=1 ttl=63 time=0.409 ms 64 bytes from 1.1.1.20: icmp_seq=2 ttl=63 time=10.9 ms 64 bytes from 1.1.1.20: icmp_seq=3 ttl=63 time=6.65 ms 64 bytes from 1.1.1.20: icmp_seq=4 ttl=63 time=6.85 ms --- 1.1.1.20 ping statistics --- 4 packets transmitted, 4 received, 0% packet loss, time 3020ms rtt min/avg/max/mdev = 0.409/6.201/10.898/3.749 ms</pre></p> <p>client <pre>00:13:35.028180 IP 1.1.1.10 > 1.1.1.20: ICMP echo request, id 21212, seq 1, length 64 00:13:36.042179 IP 1.1.1.10 > 1.1.1.20: ICMP echo request, id 21212, seq 2, length 64 00:13:37.047217 IP 1.1.1.10 > 1.1.1.20: ICMP echo request, id 21212, seq 3, length 64 00:13:38.050852 IP 1.1.1.10 > 1.1.1.20: ICMP echo request, id 21212, seq 4, length 64</pre></p> |
| 18 | <p>nmap 테스트 시 적색 표시된 부분 외에 보안이 허용된 포트가 있다면 오답 처리합니다.</p> <p>client 채점 전 VPN 인터페이스를 비활성화합니다.</p>  |

mail

```
nmap -n -sT -p0-1023 10.1.10.10 -Pn --min-rate 1000
Starting Nmap 7.93 ( https://nmap.org ) at 2025-03-30 01:11 KST
Nmap scan report for 10.1.10.10
Host is up (0.020s latency).
Not shown: 1023 filtered tcp ports (no-response)
PORT      STATE SERVICE
389/tcp   open  ldap
```

Nmap done: 1 IP address (1 host up) scanned in 0.43 seconds

```
nmap -n -sU -p0-1023 10.1.10.10 -Pn --min-rate 1000
Starting Nmap 7.93 ( https://nmap.org ) at 2025-03-30 01:11 KST
Nmap scan report for 10.1.10.10
Host is up.
All 1024 scanned ports on 10.1.10.10 are in ignored states.
Not shown: 1024 open|filtered udp ports (no-response)
어떤 포트도 출력되지 않아야 합니다.
Nmap done: 1 IP address (1 host up) scanned in 0.62 seconds
```

prx01

```
nmap -n -sT -p0-1023 10.1.10.10 -Pn --min-rate 1000
Starting Nmap 7.93 ( https://nmap.org ) at 2025-03-30 01:11 KST
Nmap scan report for 10.1.10.10
Host is up.
All 1024 scanned ports on 10.1.10.10 are in ignored states.
Not shown: 1024 filtered tcp ports (no-response)
어떤 포트도 출력되지 않아야 합니다.
Nmap done: 1 IP address (1 host up) scanned in 1.04 seconds
```

prx02

```
nmap -n -sU -p0-1023 10.1.10.10 -Pn --min-rate 1000
Starting Nmap 7.93 ( https://nmap.org ) at 2025-03-30 01:11 KST
Nmap scan report for 10.1.10.10
Host is up.
All 1024 scanned ports on 10.1.10.10 are in ignored states.
Not shown: 1024 open|filtered udp ports (no-response)
어떤 포트도 출력되지 않아야 합니다.
Nmap done: 1 IP address (1 host up) scanned in 0.65 seconds
```



client

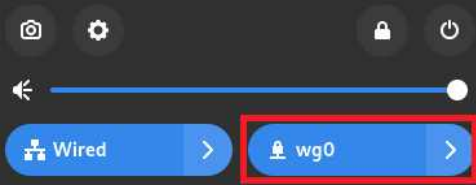

```
nmap -n -sT -p0-1023 1.1.1.10 -Pn --min-rate 10000
Starting Nmap 7.93 ( https://nmap.org ) at 2025-03-30 01:11 KST
Nmap scan report for 1.1.1.10
Host is up (0.031s latency).
Not shown: 1021 filtered tcp ports (no-response)
PORT      STATE SERVICE
53/tcp    open  domain
80/tcp    open  http
443/tcp   open  https
```

Nmap done: 1 IP address (1 host up) scanned in 0.39 seconds

```
nmap -n -sU -p0-1023 1.1.1.10 -Pn --min-rate 1000
nmap -n -sU -T5 -p0-1023 1.1.1.10 -Pn --min-rate 100000
Starting Nmap 7.93 ( https://nmap.org ) at 2025-03-30 01:12 KST
Nmap scan report for 1.1.1.10
Host is up (0.0012s latency).
Not shown: 1023 open|filtered udp ports (no-response)
PORT      STATE SERVICE
53/udp    open  domain
MAC Address: 00:0C:29:E8:30:52 (VMware)
```

Nmap done: 1 IP address (1 host up) scanned in 0.31 seconds

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| | <p>web01 nmap -6 -n -sT -p0-1023 2001:db8:1001:10::10 -Pn --min-rate 1000 Starting Nmap 7.93 (https://nmap.org) at 2025-03-30 01:14 KST Nmap scan report for 2001:db8:1001:10::10 Host is up. All 1024 scanned ports on 2001:db8:1001:10::10 are in ignored states. Not shown: 1024 filtered tcp ports (no-response) 어떤 포트도 출력되지 않아야 합니다. Nmap done: 1 IP address (1 host up) scanned in 1.02 seconds</p> <p>web02 nmap -6 -n -sU -p0-1023 2001:db8:1001:10::10 -Pn --min-rate 1000 Starting Nmap 7.93 (https://nmap.org) at 2025-03-30 01:15 KST Nmap scan report for 2001:db8:1001:10::10 Host is up. All 1024 scanned ports on 2001:db8:1001:10::10 are in ignored states. Not shown: 1024 open filtered udp ports (no-response) 어떤 포트도 출력되지 않아야 합니다. Nmap done: 1 IP address (1 host up) scanned in 0.67 seconds</p> |
| 19 | <p>client 채점 전 선수의 요구 사항에 따라 VPN 인터페이스를 활성화할 수 있습니다.</p>  <p>for i in {1..10}; do curl -m 3 -s https://www.worldskills.org/whoami; done sort -u web01 web02</p> <p>web01 halt -p</p> <p>client for i in {1..10}; do curl -m 3 -s https://www.worldskills.org/whoami; done sort -u web02</p> <p>채점 후 종료되어있는 web01 디바이스를 부팅합니다.</p> |
| 20 | <p>prx01 halt -p</p> <p>client 채점 전 선수의 요구 사항에 따라 VPN 인터페이스를 활성화할 수 있습니다.</p>  <p>echo openssl s_client -connect www.worldskills.org:443 2>&1 grep "Verification: OK" Verification: OK</p> <p>curl https://www.worldskills.org -v 2>&1 egrep "subjectAltName verify ok" * subjectAltName: host "www.worldskills.org" matched cert's "www.worldskills.org" * SSL certificate verify ok.</p> <p>curl https://www.worldskills.org worldskills web service</p> <p>curl -Lv http://www.worldskills.org 2>&1 grep redirect * Clear auth, redirects to port from 80 to 443</p> <p>curl -I https://www.worldskills.org 2>&1 grep via-proxy via-proxy: prx02</p> <p>채점 후 종료되어있는 prx01 디바이스를 부팅합니다.</p> |

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| 21 | <p>client 채점 전 선수의 요구 사항에 따라 VPN 인터페이스를 활성화할 수 있습니다.</p>  <pre> for i in {1..10}; do curl -s https://www.worldskills.org/whoami; done sort -u web01 web02 int-srv ansible-playbook /opt/rollback.yml -e "target=web02" client for i in {1..10}; do curl -s https://www.worldskills.org/whoami; done sort -u web01 web02 dpkg -l apache2 grep apache2 dpkg-query: no packages found matching apache2 ls /var/www ls: cannot access '/var/www': No such file or directory </pre> |
| 22 | <p>client 채점 전 선수의 요구 사항에 따라 VPN 인터페이스를 활성화할 수 있습니다.</p>  <pre> int-srv ansible-playbook /opt/deploy.yml -e "target=web02" client for i in {1..10}; do curl -s https://www.worldskills.org/whoami; done sort -u web01 web02 web02 dpkg -l apache2 grep apache2 ii apache2 2.4.62-1~deb12u2 amd64 Apache HTTP Server curl -s --connect-timeout 2 http://127.0.0.1/ 2>&1 worldskills web service curl -s --connect-timeout 2 http://127.0.0.1/whoami 2>&1 web02 curl -s --connect-timeout 2 http://127.0.0.1/test 2>&1 Contents Unavailable </pre> |
| 23 | <p>web02 ss -tulnp grep rsyslog</p> <pre> tcp LISTEN 0 25 0.0.0.0:1514 0.0.0.0:* users:((("rsyslogd",pid=3916,fd=6)) tcp LISTEN 0 25 [::]:1514 [::]:* users:((("rsyslogd",pid=3916,fd=7)) </pre> <p>fw, mail ss -tulnp grep rsyslog</p> <pre> tcp LISTEN 0 25 0.0.0.0:514 0.0.0.0:* users:((("rsyslogd",pid=3587,fd=6)) tcp LISTEN 0 25 [::]:514 [::]:* users:((("rsyslogd",pid=3587,fd=7)) </pre> |
| 24 | <p>fw</p> |

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| | <pre> logger qwer web02 echo "" > /var/log/fw/system.log tail -f /var/log/fw/system.log grep TEST fw logger TEST web02 2025-05-30T18:03:03+09:00 fw root: TEST mail logger qwer web02 echo "" > /var/log/mail/system.log tail -f /var/log/mail/system.log grep TEST mail logger TEST web02 2025-05-30T18:06:40+09:00 mail root: TEST </pre> |
| 25 | <pre> web02 logrotate -d /etc/logrotate.d/srv ... Handling 1 logs rotating pattern: /var/log/fw/system.log /var/log/mail/system.log 104857600 bytes (3 rotations) empty log files are not rotated, old logs are removed considering log /var/log/fw/system.log Now: 2025-06-03 16:53 Last rotated at 2025-06-03 16:00 log does not need rotating (log size is below the 'size' threshold) considering log /var/log/mail/system.log Now: 2025-06-03 16:53 Last rotated at 2025-06-03 16:00 log does not need rotating (log size is below the 'size' threshold) logrotate -f /etc/logrotate.d/srv ls -lh /var/log/mail/ -rw-r--r-- 1 root root 0 Jun 3 17:08 system.log -rw-r--r-- 1 root root 316 Jun 3 17:08 system.log.1.gz </pre> |
| 26 | <pre> web01 echo "" > /var/log/suricata/fast.log web02 원활한 채점을 위해 hping을 설치합니다. apt install hping3 hping3 -S -p 80 -flood 10.1.20.31 실행 후 ctrl + c를 이용해 바로 종료합니다. web01 cat /var/log/suricata/fast.log grep access 05/30/2025-18:25:28.458577 [**] [1:100002:1] abnormal traffic access [**] [Classification: (null)] [Priority: 3] {IPv6-ICMP} fe80:0000:0000:0000:020c:29ff:fe93:7fea:136 -> fe80:0000:0000:0000:020c:29ff:fe45:b076:0 </pre> |
| 27 | <pre> prx01 apt install tcpdump 원활한 채점을 위해 tcpdump를 설치합니다. tcpdump -nn -i any port 123 -vvv web01, web02, mail 3개의 디바이스 중 심사위원이 지정한 디바이스에서 아래의 명령어를 실행합니다. systemctl restart chrony </pre> |

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| | <pre> prx01 15:07:04.157199 ens33 Out IP (tos 0x0, ttl 64, id 42161, offset 0, flags [DF], proto UDP (17), length 96) 10.1.20.20.123 > 10.1.20.31.40978: [bad udp cksum 0x3c92 -> 0xcbde!] NTPv4, Server, length 68 Leap indicator: (0), Stratum 2 (secondary reference), poll 6 (64s), precision -26 Root Delay: 0.000259, Root dispersion: 0.000167, Reference-ID: 0x0a011416 Reference Timestamp: 3957660364.220086912 (2025-05-31T06:06:04Z) Originator Timestamp: 2306183012.700986304 (1973-01-29T22:23:32Z) Receive Timestamp: 3957660424.156947979 (2025-05-31T06:07:04Z) Transmit Timestamp: 3957660424.157100254 (2025-05-31T06:07:04Z) Originator - Receive Timestamp: +1651477411.455961675 Originator - Transmit Timestamp: +1651477411.456113950 Key id: 9 Authentication: 29db89405bbd7bafefe5953e5b144dd3 키의 상세값은 확인하지 않습니다. </pre> |
| 28 | <pre> int-srv chronyc sources MS Name/IP address Stratum Poll Reach LastRx Last sample ===== ^? prx.worldskills.org 0 10 0 - +0ns[+0ns] +/- 0ns 위와 같이 연결에 실패하여야 합니다. </pre> |
| 29 | <pre> prx01 halt -p web01, web02, mail 3개의 디바이스 중 심사위원이 지정한 디바이스에서 아래의 명령어를 실행합니다. systemctl restart chrony chronyc sources MS Name/IP address Stratum Poll Reach LastRx Last sample ===== ^* 10.1.20.20 1 6 7 0 -521ns[+47us] +/- 57us IP Address의 {prx, ns, www}.worldskills.org가 출력될 수 있으며, 해당 경우 정답 처리합니다. 재점 후 종료되어있는 prx01 디바이스를 부팅합니다. </pre> |
| 30 | <pre> mail ss -lntp4 grep stunnel LISTEN 0 4096 0.0.0.0:52000 0.0.0.0:* users:((("stunnel",pid=45715,fd=9)) client ss -lntp4 grep stunnel LISTEN 0 4096 127.0.0.1:65000 0.0.0.0:* users:((("stunnel4",pid=9340,fd=9)) </pre> |
| 31 | <pre> mail journalctl -u stunnel4.service grep succeeded Jun 02 20:22:13 mail.worldskills.org stunnel4[45611]: [] Private key check succeeded journalctl -u stunnel4.service grep CA Jun 02 20:22:13 mail.worldskills.org stunnel4[45611]: [] Configured trusted client CA: C=KR, CN=worldskills-SubCA Jun 02 20:22:13 mail.worldskills.org stunnel4[45611]: [] Configured trusted client CA: C=KR, CN=worldskills-RootCA client journalctl -u stunnel4.service grep Certificate Jun 02 20:24:20 client.ext.worldskills.org stunnel[9340]: LOG5[0]: Certificate accepted at depth=0: C=KR, CN=10.1.20.10 </pre> |
| 32 | <pre> client mount grep /mnt/shares 10.1.20.10:/root/shares on /mnt/shares type nfs4 (rw,relatime,vers=4.2,rsize=262144,wsiz=262144,namlen=255,hard,proto=tcp,timeo=600,retr ans=2,sec=sys,clientaddr=10.1.30.2,local_lock=none,addr=10.1.20.10) </pre> |

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| 33 | <pre> mail cat /proc/mdstat Personalities : [raid6] [raid5] [raid4] [linear] [multipath] [raid0] [raid1] [raid10] md0 : active raid5 sdd[2] sdc[1] sdb[0] sde[4] 94319616 blocks super 1.2 level 5, 512k chunk, algorithm 2 [4/4] [UUUU] unused devices: <none> RAID array의 디바이스 경로만 확인하며, 상세 정보는 확인하지 않습니다. 위 정보를 바탕으로 아래의 채점을 이어서 진행합니다. mdadm --detail /dev/{ array path } /dev/md0: Version : 1.2 Creation Time : Tue Jun 3 13:37:30 2025 Raid Level : raid5 Array Size : 94319616 (89.95 GiB 96.58 GB) Used Dev Size : 31439872 (29.98 GiB 32.19 GB) Raid Devices : 4 Total Devices : 4 Persistence : Superblock is persistent parted /dev/{ array path } print Model: Linux Software RAID Array (md) Disk /dev/md0: 96.6GB Sector size (logical/physical): 512B/512B Partition Table: gpt Disk Flags: Number Start End Size File system Name Flags 1 1573kB 96.6GB 96.6GB ext4 primary </pre> |
| 34 | <pre> mail reboot mount grep /mnt/raid /dev/md127p1 on /mnt/raid type ext4 (rw,relatime,stripe=384) </pre> |